# School Shop

vol. XI no. 4

DECEMBER, 1951

**Industrial-Arts Clubs Pay Off**
by Kinnaman and Beatty

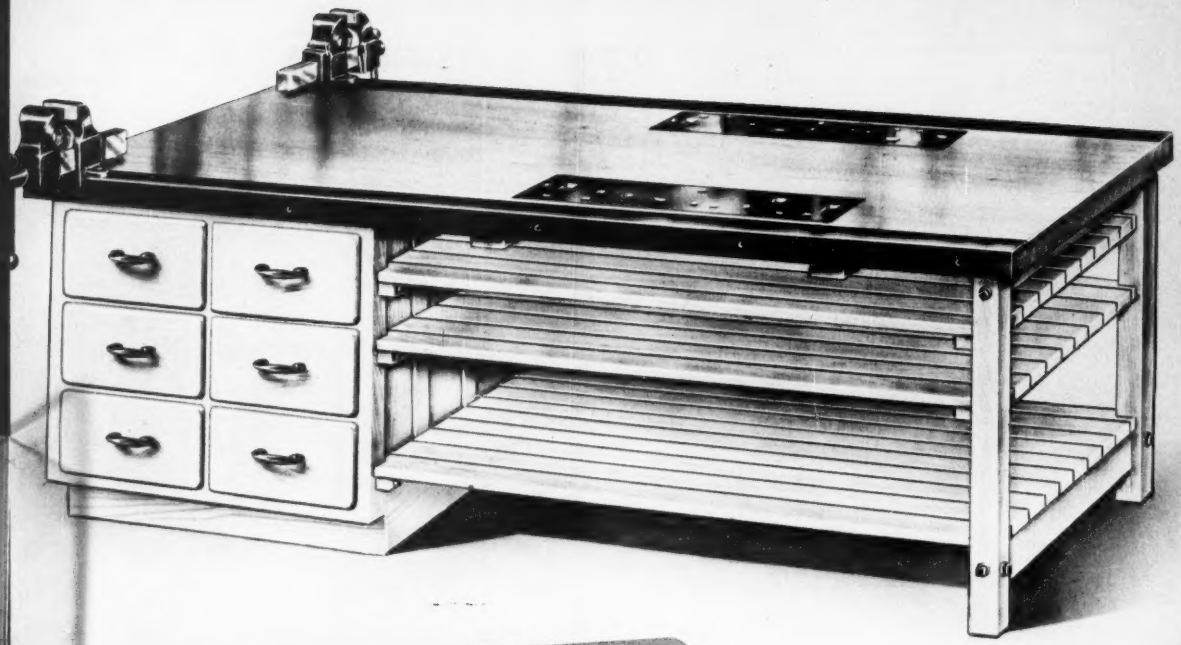
**Ceramics Belongs in the General Shop**
by R. Paul Lightle

**A Live Mock-up for Your Auto Shop**
by Marvin W. Farris

**From Washington**
Congress tees off on the Vocational Division

On the cover: Foundry students in the well-kept shop of the Thomas J. Stewart Junior High School, Norristown, Pa., where Mervyn T. Jones is the instructor.

THE MAGAZINE FOR TEACHERS OF INDUSTRIAL EDUCATION



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# School Shop

FOR INDUSTRIAL EDUCATION TEACHERS


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# School Shop TALK

**COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION**

### Industrial Education Comes of Age

The evidence is now in! Industrial education has reached maturity. No longer need teachers and administrators think of their course offerings as being the Johnny-come-lately in the curricular picture.

One of the most interesting (and long overdue) bulletins of the U. S. Office of Education contains the facts. It is called *Offerings and Enrollments in High-School Subjects* and is Chapter V in the Biennial Survey of Education.

Industrial-arts people can be proud that their subject is now taken by 25 percent of all pupils. This means that approximately half of all boys in high schools in the U. S. take industrial arts. Never before in the history of education in this country have so many youngsters been enrolled.

Even more amazing is the figure for junior-high schools where 48.2 percent of students take industrial arts which means that almost every boy is enrolled in a shop course.

These figures can only be interpreted to mean that the value of industrial arts in the minds of pupils, parents, and school administrators has been firmly and definitely established. Industrial arts is entrenched as an important part of educational offerings in our modern industrial civilization. To the teachers and leaders who have been responsible for making industrial arts a vital, dynamic area of learning goes the credit for this magnificent showing. Through the years since shopwork was first offered in the schools there has been a steady and persistent growth. The evidence shows conclusively that it was healthy and based on the real needs of students.

The largest enrolments are found in general shop, woodworking, and mechanical drawing, in that order. These three subjects account for nearly three-quarters of all enrolments in the field. Next in frequency come metal work and printing. Industrial-arts subjects which show marked increases in enrolment in the last few years include photography, home mechanics, handicrafts, plastics, and transportation laboratory. These are full-semester courses and not shorter units of study.

Vocational trade and industrial education figures also give an opportunity for interesting summary and speculation. Over a third of a million students are enrolled in T&I courses and make up 6.8 percent of the total number of pupils in grades 9 through 12. This percentage figure is much too low as it should be based on the last two or three years of high school which is the period in which practically all T&I work is given. Probably the Prosser Resolution figure of 20 percent receiving vocational education is more accurate, particularly since other types of vocational education than T&I are included.

The subjects with the most enrolments are drafting, machine shop, automobile mechanics, electrical work, cabinet making, carpentry, and printing. Other trade fields such as sheetmetal, aviation, welding, and radio show smaller altho substantial enrolments. Both radio and aviation are new to the T&I field since the last compilation of enrolments was made in 1933-34.

Another significant development in the T&I field is the diversified occupations program. Tailor-made for smaller schools where programs in particular trade subjects are impractical because of small enrolments, the D-O program has made considerable progress, particularly in some states with Missouri outstanding in this area.

New York leads all the other states in percentage of high-school students enrolled in T&I courses with the high figure of 20.6. Maryland, Pennsylvania, and Delaware are next in order with from 13 to 14 percent of students in grades 9 to 12 enrolled in T&I courses.

While there is much to be happy about in this noteworthy survey, there is still evidence of wide gaps to be filled. For instance, industrial-arts enrolments fall off at a heavy rate at the higher grade levels. While the evidence indicates that more and presumably abler students are taking shopwork, there is still too much use of industrial-education courses as a dumping ground for the scholastically maladjusted. Another area where attention is lacking is in making industrial arts attractive and useful for girls.

In vocational trade and industrial education, enrolments are still not what they should be in terms of the industrial life of future citizens. Lots of work remains to be done.—*L.W.P.*

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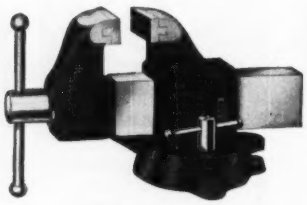

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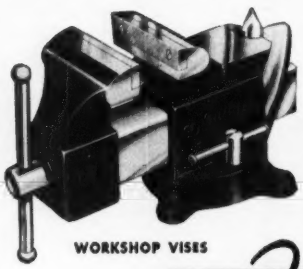

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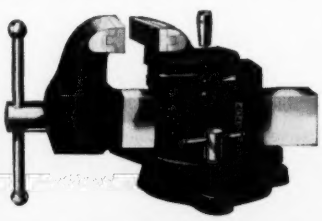

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# Industrial-Arts Clubs Pay Off

*By Donald F. Kinnaman and Donald T. Beatty*

**High-school industrial-arts clubs provide many worthwhile benefits to instructors, students, the school, and the general public, the authors assert. Their experience has completely "sold" them on the idea, and they tell you here why such clubs should become more widespread. Donald F. Kinnaman and Donald T. Beatty teach industrial arts at the Port Clinton (Ohio) High School.**

OUR high-school industrial-arts club has become highly successful, both in heightening student interest and skill in shopwork, and in improving public appreciation of industrial arts. Lack of publicity is possibly one of the greatest handicaps of industrial arts today. We have developed a community furniture repair project, a Christmas toy repair project, a unique "shop-in-operation" Open House, and field trips, which have proved to be excellent means to attain both these objectives.

### Furniture Repair Project

Club members noted that a number of people in the community had in their homes broken pieces of furniture which could be repaired. However, these people were often hesitant to have this work done because they felt the cost of repair would be many times what the article was worth. Here the club saw its opportunity. It developed a plan whereby articles are brought to the shop regardless of condition, and are completely rebuilt or refinished by the club as a group. The moderate fees collected form the main source of revenue for the club.

If a part is badly damaged or missing entirely, the students make a new one. Tables, chairs, chests, and all kinds and types of furniture are brought in. Even prized antiques go through the rebuilding processes. In most cases, furniture that is badly damaged or in poor condition is completely torn down and cleaned. Old dowels are removed and replaced, broken parts repaired or made anew, and the entire project completely reconditioned. The unit is then reassembled, sanded, and finished to suit the taste of the owner. A slight extra charge is made for pieces replaced to cover the cost of materials used from school stocks. Besides repairing furniture for homes, we have reconditioned articles for the county library.

Another project is the cleaning, repairing, and complete reconditioning of rusty, dull saws and other hand tools with handles or other component parts missing. On request, the club will undertake construction of projects of original design and projects to fit a definite need or situation.

At Christmas time, toys are turned over to the Red Cross for distribution among poor children. The method is for the boys to exchange toys, either broken or new, at their regular club Christmas party. The broken ones are repaired, and all toys are then given to the Red Cross. Another constructive element is made a part of the club Christmas party. The boys exchange hand tools which they can use in their shopwork.

### "Shop-in-Operation" Open House

Once or twice a year the Port Clinton club holds its "shop-in-operation" Open House, usually while the PTA is in session. Too often parents are "left out in the cold" so to speak, when it comes to knowing what Johnnie is doing in school. The shop has a wonderful chance to really show itself off. On these evenings our shop is in full operation with all machines going and each work-bench filled to capacity. Each club member is on hand to demonstrate his talents. Parents and friends often have questions to ask about furniture or other items in need of repair or which they are building at home, and this gives the student an excellent opportunity to tell what he knows.

Of course, the club also holds the traditional type of Open House in the spring where completed projects are displayed. The prizes offered winners are all articles they can use in their own workshops.

The club meets in the shop weekly from 7-9 P.M., or later on occasion. A short business meeting is usually held, using formal parliamentary procedure rules. There is a president, vice-president, secretary-treasurer, and sergeant-at-arms. Membership fees are 50c per

Furniture repair and refinishing provide many an instructive and recreational evening for the members of the Port Clinton (Ohio) industrial-arts club, as well as a principal source of revenue.

semester and any student from the seventh to the twelfth grade interested in industrial arts may join. Membership is strictly voluntary. Interest is so great that several of the farm boys come from as far as 12 miles, and others who are "out for sports" and often find themselves short of time for supper will skip this meal rather than miss the meeting.

### Values of Club

We believe these three special activities outlined above have had the following constructive results for the students and the community and can have the same for you:

1. **Publicity.**—When the club announced it was ready to repair old furniture, the local newspaper jumped at the chance to offer a good human interest story, and in so doing greatly helped get our club off to a good start.

2. **Public Relations.**—Taxpayers as a rule do not have first-hand knowledge of how their tax dollars are being used in the local school. Open House nights and exhibitions with the shop in operation give them a dramatic opportunity, and pay off for the school through the favorable impressions created.

3. **Citizenship and Public Service.**—The Christmas toy project and the furniture repair project bring home to the student that he can be of real service to others and get real enjoyment from doing it. By his having something constructive to do, the chance for delinquency and trouble through mischief is minimized.

4. **Student Interest.**—The industrial-arts club sells the department to students not previously interested, provides added interest to students already enrolled, and by emphasizing group work, develops better cooperation in classes.

5. **Student Competence.**—The student learns more about tools, he picks up more common knowledge and how to put it to use. The furniture repair work presents little side problems that as a rule do not turn up in the classroom. It also teaches the student how to use his ingenuity to figure out problems for himself. He organizes in his mind a set of rules of good workmanship, as he comes to recognize good design and craftsmanship. Group discussion and demonstration clear up many questions which arise.

6. **Knowledge Beyond the Classroom.**—Field trips, factory visits, and work nights will do wonders with your class in letting students understand more fully what is going on in the outside world of industry.

7. **Encouraging Potential Instructors.**—A club is an excellent medium for discovering and encouraging potential industrial-arts teachers.

### Industrial Plant Trips

Each school year the Port Clinton industrial-arts club takes at least one or two trips by chartered bus to large industrial plants. Two years ago the boys attended the industrial-arts get-together at Bowling Green State University. Last year the group spent a long day touring the many departments of the Ford Motor Co. and the Edison Institute in Dearborn, Mich. The big trip this year was to Cleveland. Several nearby plants are visited each year also by the club group.

The Dearborn trip will show how arrangements are made. Forty-eight members of the club went along during a regular school day with the complete sanction of the principal and the superintendent. However, each student had to have the signatures of each of his teachers to show that his school work was completed up to the day of the trip. Parent authorization by signature was also required. All arrangements with the factory were completely worked out well in advance of the trip. This enabled officials to show us parts of the plant which are not normally visited by groups.

We found that industries, as a rule, are willing to aid the education of youngsters in this way, and will often go out of their way to give an interesting tour of their organizations. Transportation for the shorter trips can be made by school bus, since the trips are educational.

On certain years our school is visited by the Midwestern Ohio Industrial Arts Association. This meeting, which offers a large dinner, plant tour, and school visitation, offers more opportunities for the industrial-arts club to serve. Members of the club act as plate servers, dish washers, and information guides during these festivities. This year the club voted to offer some door prizes to augment those regularly offered. This was done to act as an incentive on the visting instructors present to organize clubs in their schools.

### Club Active in School

The Port Clinton club enters all intramural sports and has a fine team for each event. It works closely with the school's student council and any other group to which it can give assistance. This may mean building scenery for a play, doing some construction work for a dance, or building risers for the chorus.

At this stage some of you will undoubtedly be saying: "This is all very nice, but it takes much more time than I have to expend on such activities." In the present day, time is certainly at a premium. However, the real values obtained as listed above, as well as the enjoyment one gets from working with the boys in the informality of an out-of-school situation more than compensate for the extra time and effort required. And there are ways of cutting down the demands. If more than one instructor is available, the time can be divided. Organizing committees with definite duties and a good chairman will remove much of the burden from the instructor, and will give students the chance to see through their own problems and use their initiative to best advantage. ★

These shop club students show what can be done with old, rusty, worn-out tools. Max Knepper (left) holds the finished job, and Lee Hetrick holds untouched saw.

# Blueprint Frame

**A project for beginners which makes a handy shop tool. G. Shalkhauser is an instructor at El Paso, Texas.**

**By George Shalkhauser**

THIS simple woodworking project has the advantage of being a useful addition to the shop. It teaches elementary principles of gluing, joining corners, hole-drilling, beveling, etc.

This small-size frame takes standard tracings up to 12" x 18". Finger holes aid handling.

The small-size frame will take standard size tracings up to 12" x 18". It is intended for use in making blueprints using sunlight. The three holes provided in the ends are finger holes to facilitate handling the frame, which may be made of pine. The tension bars should be of close-grained hardwood such as birch or maple.

In building the frame, the corners should be joined as shown in the drawing. Flat-head wood screws used to fasten the corners in addition to gluing the joint make the frame very rigid. One set of strips used to hold the glass in place (preferably the ones on the inside of the frame) should be fastened in with brads only. This will make it easier to replace the glass should it become broken. The other set of strips should be glued and bradded in place.

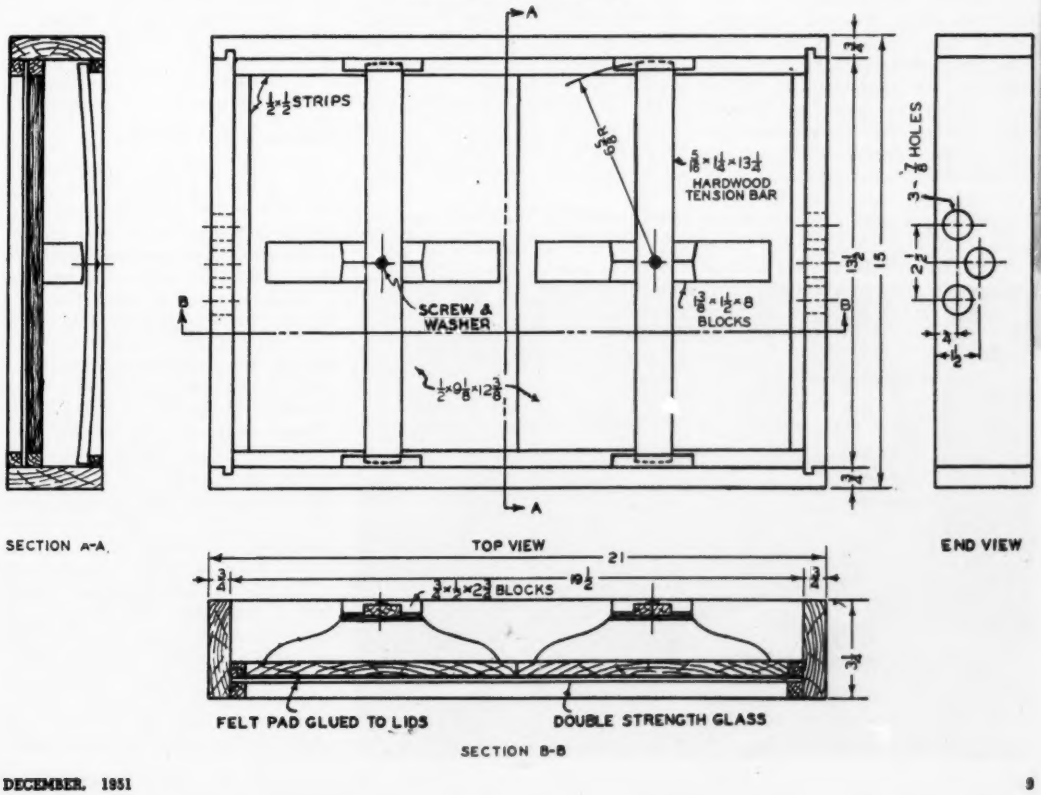
Bevel the blocks used under the tension bars. The small blocks used to hold the ends of the tension bars should be of hardwood and fastened in place with glue and flat-headed screws. Use small steel washers above and below the pivot on the tension bars.

Finish the frame with shellac or clear varnish. ★

### 13 Is a Lucky Number!

BOOTH 13 will be the headquarters for SCHOOL SHOP at the Minneapolis Convention of the American Vocational Association November 26 to December 1 at the Municipal Auditorium. We are looking forward to seeing our many friends there and extend a cordial invitation to all to stop by. Don't overlook Booth 13—even on Friday!

BLUEPRINT FRAME



# Ceramics Belongs in General Shop

*By R. Paul Lightle*

**More industrial-arts instructors should include the ancient art of ceramics in their programs, asserts the author. He details an inexpensive set-up for a general shop which may be expanded for a unit shop. Industrial processes may be learned by use of the commercial molding process. R. Paul Lightle is industrial arts instructor at James Smart School, Fort Wayne, Indiana.**

Some of the finished pieces molded by junior-high-school boys in the Smart School.

ALTHO ceramics as a craft is very old, it has been neglected in the field of industrial arts. One of the reasons for this neglect may be the fact that many teachers look on ceramics solely as an art. It should be considered from both the artistic as well as from the industrial or commercial standpoint.

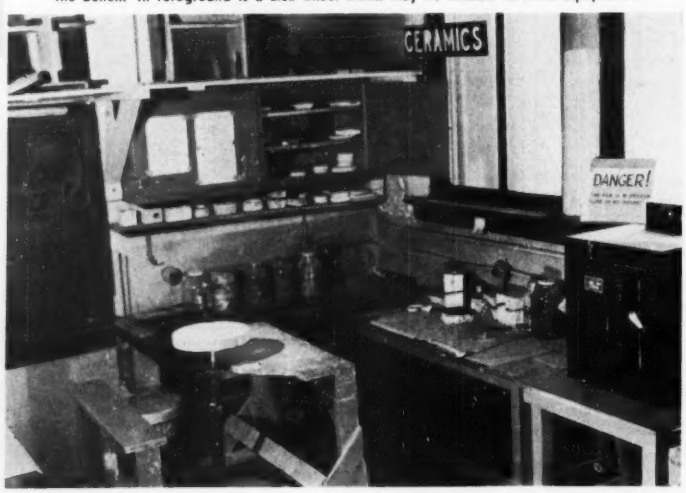
The basic material used in ceramics is clay. The art has been practised by all civilizations from the ancient Chinese, Greeks, Romans, and all others down to modern times. Usually when one reads of the discovery of an ancient tomb or grave dating back hundreds or even thousands of years, one will notice pottery or crude clay articles listed along with other discoveries. Such ceramic relics are also discovered in Indian graves in North, South, and Central America. At the time of the discovery of America, the American Indian had developed pottery making to a fairly high degree of perfection. Today, ceramics remains as one of the Indians' most highly publicised crafts.

Many people earn their living through the manufacture and sale of ceramics, while many others enjoy it as a hobby. Many public schools offer ceramics in their industrial-arts, art, and adult education programs. Some universities offer training leading to the degree of ceramic engineer.

Ceramics offers a challenge to old and young alike since there is an opportunity for creative expression not found in most crafts. Many fundamentals of ceramics are very simple and easily understood. The beginner with a very meagre knowledge may achieve very satisfying results often on his first attempt.

The purpose of this article is twofold: first, to acquaint the reader with some of the fundamental industrial applications; and second, to show how these fundamentals may be used in the industrial-arts program.

Ceramics area in a general shop. In background, mounted on wall, is drying cabinet, under which is shelf for safe storage of plaster molds. At right is the kiln and the work bench equipped with four drawers for supply storage. Glass jars, obtained from the janitor, are kept at the back of the bench. In foreground is a kick wheel which may be classed as extra equipment.




### Objectives in Ceramics

The following objectives may be achieved with beginners in the general shop. The list may need to be expanded if used in a unit shop.

1. To give the pupil an additional mode of self-expression.
2. To develop hobbies and worthy use of leisure time.
3. To teach appreciation of pottery, both modern and past, through a knowledge of how it is produced.
4. To teach principles of design.
5. To contribute to the general education of the pupil.
6. To teach industrial practices and applications insofar as is possible.

### Equipment and Supplies

The ceramic equipment need not be elaborate for a beginning. The space the unit will occupy and the number of persons working simultaneously need to be considered. The equipment listed will accommodate six workers. After the group gets started to work they may spread out, using other shop facilities. For such operations as glazing, mold making, smoothing the castings, etc., students may use their regular work stations if necessary.

Some equipment such as the drying cabinet and the work bench may be built in the school shop at a considerable saving. Sponges, spoons, sandpaper, and other odds and ends that come in so handy may be picked up at random around home and school.

The following list of equipment represents a beginning with only a small outlay of capital represented. The total expenditure, including consumable supplies, will not exceed $200. If a smaller kiln is purchased this amount may be reduced even lower. The scope of the work, however, will be limited consider-

Boys at Smart School, Ft. Wayne, Ind., strain "slip" as they pour it into a plaster mold.

ably by a small kiln. As interest in the area develops additional equipment may be added to enrich the program.

#### Basic Equipment

Drying cabinet, workbench, nonmetal pitcher, sieve, modeling and decorating wheel, tea strainer, table knife or spatula, electric kiln 8" x 8" x 11" (inside dimensions) equipped with a pyrometer, and six large-mouth paste jars (for storage of slip). Note the picture of the ceramics area in our general shop.

#### Consumable Supplies

Four lbs. of assorted glazes, one set of underglaze colors, 4 doz. stilts with nichrome points (assorted sizes), 100 lbs. of molding plaster, 100 lbs. white slip casting clay, 100 lbs. of red slip casting clay, 10 lbs. kiln wash, three camel-hair brushes for decorating purposes, 1 doz. tongue depressors, and two good textbooks on general ceramics.

### Methods of Production

There are four common methods used in the production of ceramic pieces—throwing, coil method, slab method, and slip molding.

#### Throwing

In this procedure a piece of clay is centered on the kick wheel, and as the wheel revolves the potter shapes the clay with his hands. This procedure is very difficult and requires much time and effort to develop skill.

#### Coil Method

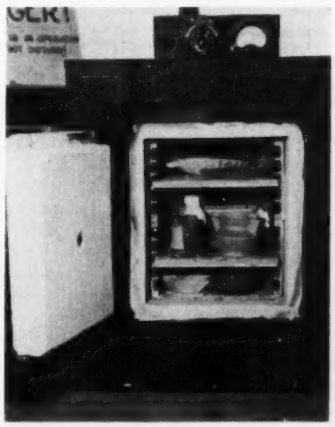
This method is used frequently by beginners. Clay is first rolled out into long, rope-like, cylindrical-shaped pieces about ½"d. In shaping a vase or bowl, one first constructs the bottom starting at its center and working out. By spiraling the clay round and round, the desired diameter is obtained. As each piece of clay is shaped, it is pressed into the preceding piece with the fingers and possibly a knife or flat stick such as a tongue depressor. The sides of the bowl are made in much the same manner except one roll of clay is placed on top of the preceding one. By carefully uniting the pieces and smoothing the rough surface, very interesting results are obtained. Much of the Indian pottery is made by this method which is applicable to the elementary grades and industrial-arts classes.

#### Slab Method

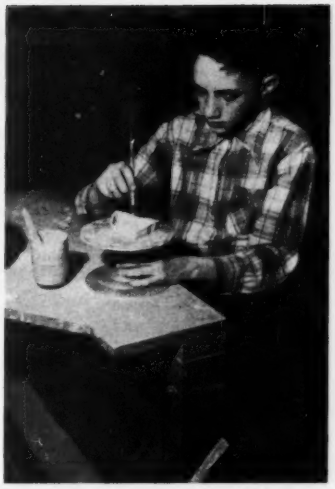
This is similar to the coil procedure except rectangular slabs of clay are rolled out to a uniform thickness of about ¼". The pieces are cut to the desired shape and placed in position. The joints are pressed together with the fingers as in the coil method.

#### Slip Molding

This is the method used by industry for the production of identical pieces such as cups, vases, figurines, etc. Clay is mixed with water to form what is commonly called "slip." Slip is poured into plaster molds until the mold is completely filled. As the water from the slip is absorbed by the plaster mold, therefore additional slip must be added to keep the mold full. After the mold stands 15 to 20 minutes, one should blow gently against the top surface of the slip filled mold. The thickness of the casting may be seen as it forms on the outer portion of the mold. In about 30 to 45 minutes the wall of the casting will reach the desired thickness. Tilt the mold, returning the surplus slip to its container. Allow the casting to dry until it shrinks enough to pull away from the mold. The casting may now be removed from the mold and placed in the drying cabinet for curing. After it is dry, any imperfections may be smoothed out with sandpaper or a knife and it is ready for the biscuit firing in the kiln.



Kiln stacked for biscuit firing. Kiln wash, used to prolong the life of the fire clay lining, may be seen on the door of the kiln.



Brushing the glaze onto a small dish. It may be applied with a hand spray gun, or the article may be dipped into a larger quantity of glaze.

Since the slip method is used by industry, I feel that it is the logical starting point for industrial arts. Anyone familiar with pattern-making principles will find that many of these principles carry over into slip molding. A good text will give the complete, illustrated, step-by-step procedure for making plaster molds. The easiest mold to make is the one-piece type; from this one may branch out into the two-piece and possibly three-piece types. Commercial molds are readily available at many industrial-arts supply houses. It is good to have a few professional molds if for no other reason than to see the finer points of mold making which you may incorporate into your own molds.

### Firing the Pieces

Most ceramic pieces require two or possibly three firings. The temperature of the kiln should be raised slowly and gradually for best results.

#### Biscuit Firing

After the piece is made, it is set aside to dry. If fired while it is too moist, it may crack and be ruined. No piece is entirely free from moisture until it has been fired. At the start of the firing operation the kiln door should not be closed too tightly, as moisture baking

(*Continued on page 27*)

# A Live Mock-up for Your Auto Shop

*By Marvin W. Farris*

**This excellent animated visual-aid device for the auto shop will stimulate student attention and speed learning. Its construction is a good cooperative group project. Marvin W. Farris is auto mechanics instructor at Erath County Vocational School, Dublin, Texas.**

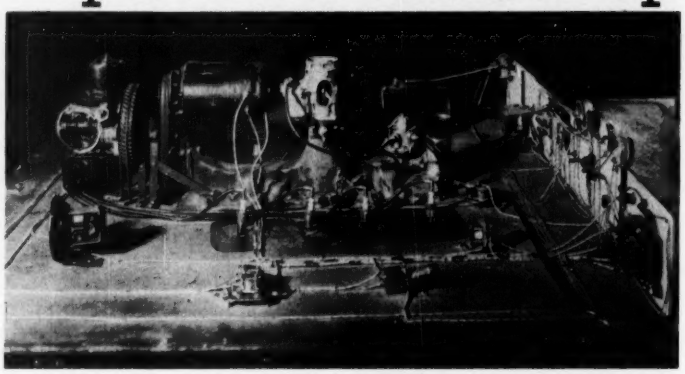


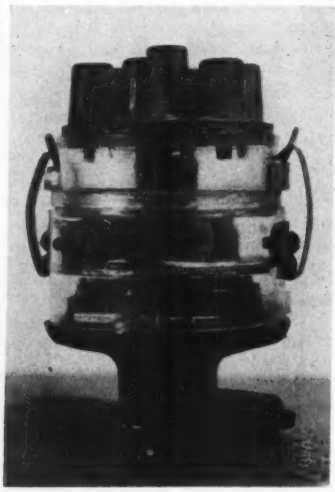
Fig. 1—Side view of front section of fuel and electrical system mock-up. Main part of apparatus in center includes (left to right) 1941 Ford V8 distributor with coil and condenser, camshaft gear with bushing housed in pipe, generator, and manifold with fuel pump and carburetor mounted in place. Behind and in front of manifold are spark plugs accompanied by neon testers. Also mounted on table in foreground are vibrator-type horn, double light relay, horn relay, dimmer switch, bulb electric heat indicator, and oil pressure gage. Mounted on dashboard at right are voltage regulator, light circuit breaker, ignition resistance unit, solenoid starter switch, in addition to units described in caption 2. Behind fuel pump at right is starter. Parts are cut away as much as practicable.

HERE is an automobile wiring and fuel mock-up that can be built in the school shop by the auto-mechanics class. Building it provides experience for the students and when finished the instructor has a good teaching aid for the electrical and fuel system of the automobile. Most mock-ups and cut-aways are lifeless things and after the student once examines them they no longer hold his interest. This one is "alive" and the student will enjoy experimenting with it as long as he is in the class. The electrical part of this mock-up is more spectacular than the fuel system, but if a good cut-away job is done on the fuel pump and carburetor, the fuel system will be laid out so that the student can see every part in operation.

### Angle-Steel Table Frame

First, build a table frame 4′ wide and 8′ long out of 1″ angle steel and brace securely. This steel frame will provide a ground for all the electrical units on the table. Cover this frame with a 4′ x 8′ board of Masonite. Masonite is good electrical insulation, it drills easily, and is hard and stout enough to hold a screw or bolt. Also cut a 9″ x 4′ strip of Masonite and mount it upright across the center of table.

Fig. 4—Delco-Remy distributor with most of housing and part of cap cut away and replaced with plastic to make operations visible as described in ninth paragraph of text. The author uses this on one of his shop engines. A 1949 V8 distributor would do just as well.



Cut away a Ford V8 manifold and bolt it in the center of the table with the back edge of the manifold 9″ from the upright board. This will be called the front of the table (see Fig. 1). Cut away a fuel pump and carburetor and mount on the manifold. On the other end of the table paint the outline of a gasoline tank and mount a tank gage unit on this outline. Connect gas lines from gas tank to fuel pump to carburetor as they are connected on the car.

### Mount Dashboard Units

On the back side of the upright board facing the "gas tank," mount all the electrical units, switches, and lights that are on a Ford V8 dash (see Fig. 2). Also mount a horn button. Cut away all units that you can without impairing their operation. On the front side of the upright board instal a voltage regulator with cover off, the light circuit breaker, the ignition resistance unit, and a cut-away solenoid starter switch.

Using Ford cylinder heads for patterns, outline the heads on the table on each side of the manifold. Mark spark-plug holes in proper position. Drill holes in table for spark plugs to screw into, and instal plugs. Get neon electrical testers (the kind with the two wires attached). Drill a hole by each spark plug and fasten a tester in each hole with the neon tube on top of the table and the wires underneath the table. Connect one wire of the tester to the points of the plug next to it and attach the other wire to the steel table frame.

### Instal Lights

Fasten double-light sockets on all four corners of the table and instal double-filament bulbs in each socket. This will give high and low beam for front lights and tail and stop light for the rear. On the right side of the table facing the manifold, instal a cut-away dimmer switch and a double light relay and horn relay, each with covers off. Behind the marked-off cylinder head on this side, instal a cut-away oil pressure unit gage. Also on this side of table instal a cut-away bulb electric heat indicator. On one front corner of the table mount a motor-driven horn and on the other front corner mount a vibrator-type horn. Remove covers from both horns. Mount a workable cut-away Ford starter on the table to the left of the manifold.

Mount either a cut-away generator or a live generator in its place on the manifold. I have tried using a live cut-away generator, but due to the strong magnetism set up when the generator starts charging, I have never been able to keep the armature from dragging after cutting away part of the generator housing. It is better to use a live generator, for then the voltage regulator will be operating.

### Using 1941 Distributor

Use either a 1941 model or 1949 model Ford V8 distributor. I will give the 1941 model set-up first. Take a Ford V8 camshaft, leave the gear on, and cut it off close behind the front camshaft journal. Using a hacksaw, cut a groove around the camshaft gear in the center of the teeth, so that a sewing machine belt will fit on. Get a front camshaft bushing and fasten it securely in a piece of pipe or tubing the same length as the bushing. Drill a hole in center of pipe and bushing for oiling. Fasten four 5" legs to this bushing holder, and bolt to the top of the table directly in front of the generator. Just allow a bare clearance between generator pulley and bushing. Put the camshaft with gear in the bushing and see that it turns freely. Cut away a 1941 model V8 distributor. Drill a hole in the bottom so that a taillight bulb can be fastened. Be careful to see that the two prongs on the distributor rotor clear the bulb. Mount the distributor on 4" legs and bolt to the table directly in front of the camshaft. See that the camshaft turns the distributor shaft without any binding or vibration. Instal coil and condenser on the distributor.

### Using 1949 Distributor

If using a 1949 V8 distributor, hook up the distributor drive, using late model parts, in the same way as the 1941 distributor. Use the timing gear cover to make a bracket to hold the distributor. Take a 1949 distributor and cut the distributor housing off so it is smooth with the bottom part of the housing. Cut the top off the distributor cap. Get a 9" x 5" sheet of cellulose acetate .060" thick to make the parts of the housing and cap that have been cut away. Use a piece of pipe or round bar steel 3¼"d for a mandrel. Wrap cellulose acetate tightly around this mandrel. If a steel sleeve the right size to hold the acetate around the mandrel is not available, wrap acetate tightly with cotton cord to hold in place. Dip mandrel and acetate in water that has just reached the boiling point and hold there for about 5 sec. then remove and let cool thoroughly before removing the sleeve or string. This will make a clear plastic tube with the same inside diameter as the distributor housing and cap. Use acetone to bind the seam together, reinforcing with a ⅜" strip of .060" thickness acetate.

Cut a ⅝" length from the plastic tube for the distributor housing. Fasten four lugs of acetate around one end of tube an equal distance apart. Drill four small holes around the bottom of the distributor housing, the same distance apart as the lugs on the plastic tube. Fasten plastic to housing with small wood screws. The lugs on the tube will give a base to hold screws. Fasten the other 1⅜" tube to the top of distributor cap in the same manner. Stick two lugs of acetate in the proper place on the plastic part of the cap for the hold-down clips. Use acetone for putting together all cellulose acetate parts. When finished, if the acetate is blurred from handling, dip into acetone to clear.

This will make a distributor with all the working parts visible, yet which will still function as it originally did. This distributor can be used on a live engine. A Delco-Remy can be built in the same way.

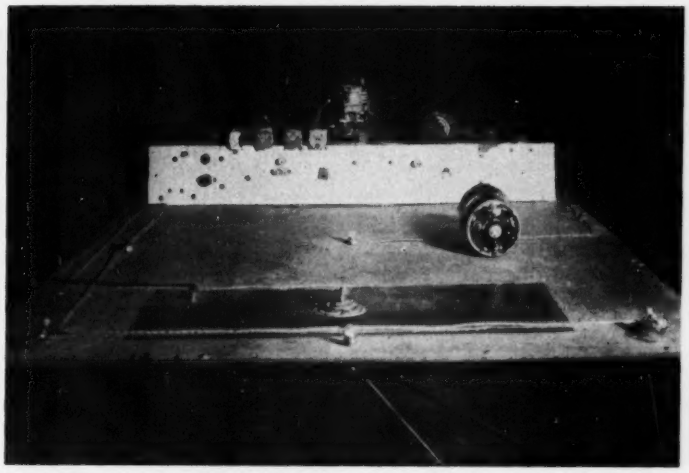


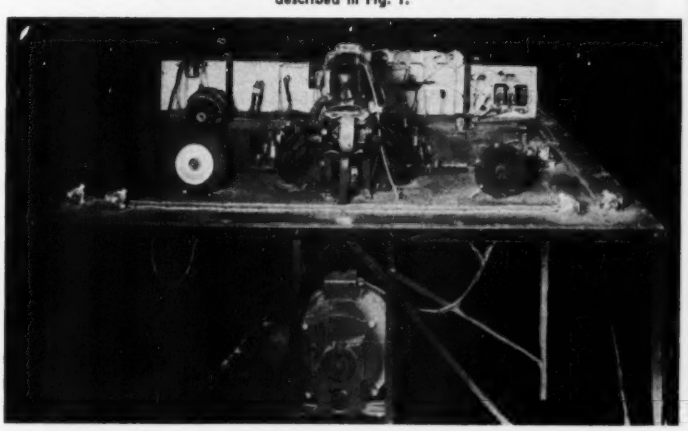
Fig. 2—Rear section of mock-up includes painted gas "tank" with mounted gage unit (center foreground), two double-socket tail and stop lights (left and right foreground), and, on upright board, the various electrical units, switches, lights, and horn button found on a V8 dashboard.

### Ready for Wiring

When all units are in place the board is ready for wiring. Ground to the steel frame underneath the table top all units which must be grounded in order to operate. Put switch for electric motor beside ignition switch for convenience. Use the wiring diagram of the model car used to wire all units. Use a different colored wire for each circuit to make it easier for students to pick out the individual circuits. Staple wires to board with enough space between wires so that circuits can easily be traced. Run wires in straight patterns with 90° turns. The neatness of the wiring job helps the appearance of the project. Put the light in the distributor in a circuit by itself, op-

(*Continued on page 27*)

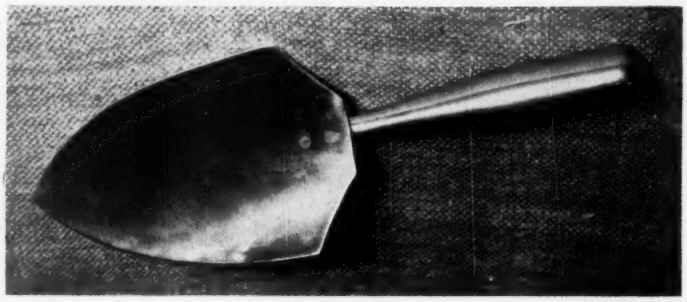
Fig. 3—This view of front section of mock-up shows power source—electric motor beneath table, fitted with two pulleys to pull both distributor and generator. In foreground on top of table are two sets of double-light sockets and motor-driven and vibrator-type horns. Other apparatus is described in Fig. 1.



# Trowel Project Gives Variety

*By Andrew Kovach*

**Making of garden trowels gives students a good variety of tool processes. The material may be aluminum, as in this case, or steel. Andrew Kovach teaches at Hershey Industrial School, Hershey, Penna.**



Ford Motor Photo

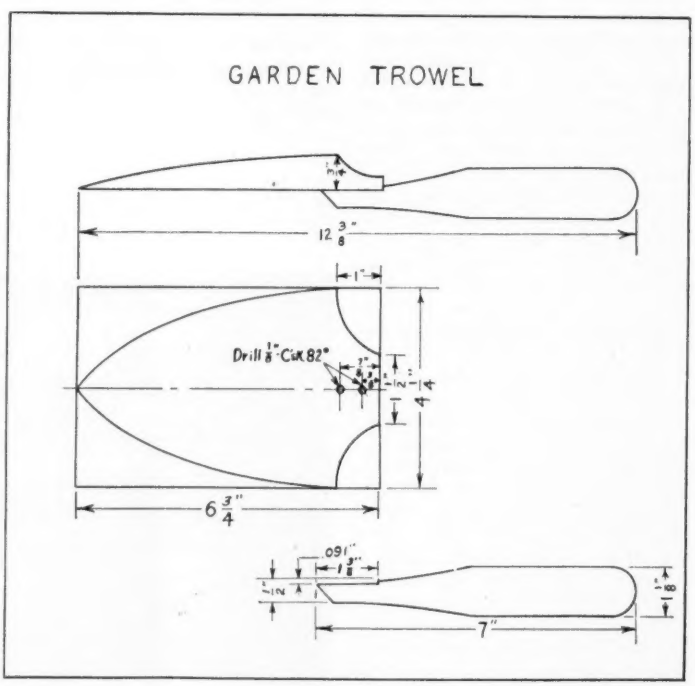
**This wrought aluminum trowel was made by Robert Gunselman in Grade 9 and won honorable mention in the Ford Industrial Arts Awards.**

GARDEN trowels as a junior- or senior-high-school industrial-arts project are readily acceptable to most students. The project offers sufficient variety of tool processes and use of materials to be adaptable to any shop situation. In this particular case aluminum was used throughout, but sheet steel for the body, $\frac{3}{8}$" square mild steel for a handle shank, and a turned wood handle could be substituted with equally good results. The following description will deal only with the fabrication of an aluminum trowel.

The body is made of .091" thick 24 ST aluminum alloy. After the body is laid out it may be roughed out by hand sawing, shearing, or by use of a metal-cutting band saw. Finishing to layout lines is accomplished with files and the edge is finally burnished. Forming rolls are excellent for curving the body but in their absence a sheetmetal stake and mallet would be found suitable. Rivet holes should be laid out after the body is formed as they may become distorted in the forming process. The holes should be countersunk from the inside of the trowel to receive the $\frac{1}{8}$" countersunk rivets. The degree of finish desired on the body as well as the handle will determine whether or not you choose to use abrasive cloths and buffing equipment. Most students will prefer to put a very high finish on the trowel if aluminum is used.

A little foundry practice was employed in making the handle. A two-piece pattern was used to make a green sand mold and casting. If metal-working machines are available in the shop, the handle can be finished on the lathe and shaper. In the absence of a metal-turning lathe the handle can be finished by mounting on a wood-turning lathe. The latter method will require some special consideration to prevent damage to tail-stock center if a spinning center is not available and will also require a slotted faceplate to receive a lathe dog. A scraping tool made of a heavy file will suffice for the preliminary finishing which would have to be followed up by finishing with a file and abrasive cloth. The offset to receive the body can be produced by filing.

Holes for rivets in the handle are countersunk to give a flush surface to the handle. Use countersunk rivets, peen them into the countersunk holes in the handle, and finish off with a file. ★



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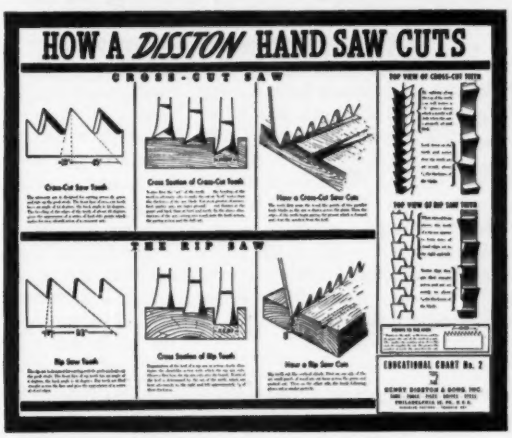


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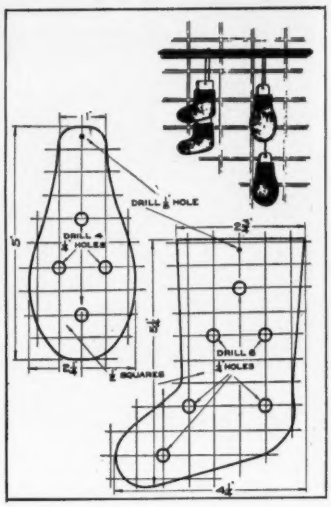
# Mother Will Like This Bootee Drier

*By Harold O. Akeson*

**Here is a good beginning project in elementary-school woodworking. The finished articles will appeal to the mothers of pupils with smaller brothers and sisters. Harold O. Akeson is instructor in mechanical drawing at East Orange, N. J., High School.**

THERE is nothing more disappointing for a mother of small babies than to have a supply of mittens and socks, only to find that, after washing, they cannot be used because they have shrunk.

When dried on wooden stretchers, like the ones shown, mittens and bootees are dried to their original size and shape. Making these stretchers constitutes an excellent elementary-school shop project. It is best to use hard woods, such as maple or birch. However, some soft woods as white wood or hard pine could be used.




Draw the shape of sock or mitten with the grain of the wood. If many are to be made, plan them economically on the piece of wood to get the most out of the material.

Cut out the shapes with a coping saw, or band saw if one is available. Use a coarse, #2, sandpaper to smooth the edges. Follow up with a fine grade, #½ or #0, to give a smooth finish. Do the same with the flat surfaces.

Holes should be drilled to let the air circulate, thus aiding the mittens or socks to dry more rapidly. Make them with a ¼" drill and space them at convenient locations. The proper number of holes are indicated on the drawing. Too many holes would weaken the wood and cause the form to crack when continually subjected to moisture and then dried.

No paint, shellac, or varnish is necessary. The wooden forms should be sandpapered until very smooth and soft to the touch.

Tied through the hole of each piece, near the top, as shown in the drawing, is a piece of twine which can be made any convenient length for hanging up the forms when socks or mittens are drying on them.

When one's individual needs have been met, these forms may be made as gifts which would be greatly appreciated by friends or relatives. ★

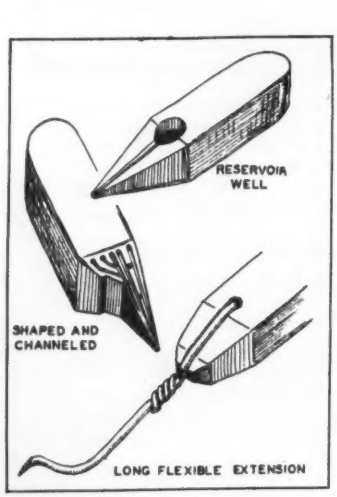
# Solder Tips

**By Simon S. Palestrant**

**All of us, at one time or another, have had a soldering job to do for which the ordinary blunt solder iron tip was of no use. Here's how to modify your iron for a variety of fussy jobs. Simon S. Palestrant teaches in the New York City, N.Y., schools.**

THE average craftsman has many and varied calls for special soft solder jobs. Some require coverage of surface, others, pin-point contact, so it is advisable to use a solder iron with replaceable points. Each tip is then shaped for its specific purpose.

It is wise to drill a well slightly above the point, then cut a feed channel to the tip. In that way a quantity of solder may be stored above and allowed to flow toward the point of contact as needed, by tilting.




Round, blunt, flat, and pointed are all shapes into which a solder tip may be ground depending on the requirements.

Very great demand is made of the solder iron to reach remote points in out-of-the-way places. Radio repair men, art metal workers, refrigerator mechanics, and motor repair men all require a tip which will reach some difficult-to-get-to spot and land on a pin point. If you thread a piece of #8 copper wire through a hole drilled into a solder-copper, then twist it tightly over the point (see illustration) you will have the answer to that problem. File a small guide channel on each face of the solder-copper from the hole to the point to keep the copper wire from slipping about, and allow for a snug joint. One end of this wire is cut off at the end of the twist while the other extends as long as is needed. The end of this extension is filed to a suitable point and tinned.

This wire may be bent to circumvent any obstacle in order to reach the place which needs the solder. It may be alternately bent whenever needed for other job requirements.

I have found this to be a very useful kind of solder point. I think you will, too. ★

# On cut-off jobs . . .

## *You benefit 4 ways with Wells Saws*

1. Fast, continuous cutting action.
2. Greater accuracy on each job.
3. More pieces per length of stock.
4. Greater overall economy.

**Illustrated is the popular Wells No. 8 with wet cutting system.**

Our 25th year of service

HORIZONTAL band sawing is the modern, cost-cutting way to handle cut-off jobs . . . and Wells Saws are the leaders among horizontal metal cutting band saw machines. Simplicity of design means fewer moving parts and easy operation. Ruggedly built to increase productivity and reduce cutting costs, a Wells Saw pays for itself quickly and will give you years and years of dependable, satisfactory service.

**BIG JOBS** or LITTLE Jobs . . . There's a "WELLSAW" to meet your Metal Cutting Requirements. Check the table below and write for complete descriptive information or a job demonstration.

| MODEL | 49 A | No. 5 | No. 8 | No. 12 |
|---|---|---|---|---|
| Capacity in inches: Rounds | 3½ | 5 | 8 | 12¾ |
| Rectangular | 3½ x 6 | 5 x 10 | 8 x 16 | 12 x 16 |
| Blade speeds, ft. per min. | 54, 100, 190 | 80, 90, 130 | 80, 90, 130 | 60, 100, 150 |
| Motor Size | 1/6 H.P. | ⅓ H.P. | ½ H.P. | ¾ H.P. |
| Floor Space, in inches | 16½ x 38 | 21 x 50 | 24 x 72 | 32 x 78 |
| Wet cutting system | No | Yes | Yes | Yes |

Automatic stock projection available for Nos. 8 and 12.

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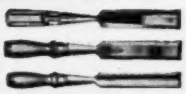
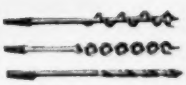


### AUGER BITS, CAR BITS AND DRILLS

There's a GREENLEE for every need . . . all types of twists and heads. Accurately sized, perfect cutting edges. Line includes the famous "Greenlee 22" Solid-Center Auger Bits which come to you "Plastic Sealed" for factory-sharp edges.



### EXPANSIVE BITS

Fast, easy-boring Expansive Bits with free, positive chip clearance. Specially-designed wide, open throat assures smooth, uninterrupted action. In two styles — Setfast with quick adjusting-locking feature and Plain.

### SPIRAL SCREWDRIVERS AND AUTOMATIC PUSH DRILLS

GREENLEE Spiral Screw Drivers are sturdily constructed and have special phosphor bronze drive nuts for long, hard service. Beautifully finished, three sizes. Automatic Push Drills have completely enclosed working parts and phosphor bronze drive nuts. Handle holds eight points. Chromium plated.

**The GREENLEE line also includes Bit Extensions, Razor-Blade Draw Knives, Ship Augers, Electricians' Bits, Hand Benders for Tubing, Radio Chassis Punches, Knockout Tools and many other timesaving tools for the shop worker and the student.**

TOOLS FOR CRAFTSMEN
GREENLEE

**Free Folder H-301 with complete data on GREENLEE hand tools for the woodworker. Write Greenlee Tool Co., Division of Greenlee Bros. & Co. 2052 Twelfth Street, Rockford, Illinois. U. S. A.**

# What's the Name of *Your* School?

*By Keith Kerwin*

**It is always of interest to the passer-by to recognize a school by its name rather than merely as a building. This project has the added advantage that it provides a school activity in which a number of students in different departments may take part. They can obtain satisfaction from the fact that they are making a contribution to the school, of which they can be proud. The signs shown in the illustrations were made under the direction of John Bahr, in the Edison Vocational High School, San Bernardino, California.**

This sign involves design and drawing, as well as pipe cutting, sawing, and welding.

HOW many times have you driven past a school and wondered whether it was a grammar school or a high school? Or what its name was? The problem of providing this information for the passing public is being solved by John Bahr's vocational welding class at Edison Vocational High School, San Bernardino, California. The class has embarked on the project of providing suitable name plates for all the schools in the city. So far, two such name plates have been constructed and installed—one for Fairfax Elementary School, and one for Edison Vocational High School.

For both of these schools, the letters were designed by the art classes of the San Bernardino High School. The designs were then given to the drafting classes in the same school, and detailed blueprints were made from them. The welding class constructed the signs from these blueprints.

At the Fairfax school, the letters were mounted on a vacant wooden wall. Bolts 3/16" in diameter, and about 5" in length, were welded to each letter. Holes were drilled in the wall and the letters secured with a nut and a lock nut. After the letters were mounted, the thread ends of the bolts were spread with a small chisel to prevent theft.

As illustrated in the picture, the letters at Edison High School were mounted in a different manner. Other methods of mounting are likely to be used before the class completes the project. This variable factor provides the students with opportunities to make decisions concerning construction details, and adds greatly to the class interest in the project. ★

This sign involves the processes mentioned above, and has the added process of thread cutting for the bolts with which it is fastened to the wall.

## Strictly Personal

ABOUT YOUR FELLOW TEACHERS

J. E. HILL has been appointed director of vocational education for Illinois. . . CLEVE LOMAN is now with the Virginia State Department of Education, T & I Service. He formerly was in the Navy. . . WILBERT C. BOHNSACK has been appointed assistant supervisor of industrial arts for the Milwaukee, Wis., public schools. . . EDWARD T. DONNELLY, director of industrial arts in Athol, Mass., has been appointed assistant professor and supervisor of industrial-arts student teaching at the State Teachers College, Fitchburg. . . H. I. JAMES has taken over his duties as director of the new State Trade School at Tuscaloosa, Ala. He was assistant superintendent of Gadsen schools. . . M. O. HULSEY, assistant V.I.E. supervisor for Alabama, has been given one year's leave of absence to work with DR. E. R. PLOWDEN, director, Institute of Inter-American Affairs, for Brazil. J. C. HUNNICUTT, coordinator at Lanett, Ala., will assume Dr. Plowden's duties at the University of Alabama during his absence. . . ARTHUR G. HORSTMANN retired as head of the drafting department at the David Ranken, Jr. School of Mechanical Trades, St. Louis, on Sept. 13. . . ERNEST E. PLOEGER, trade and industrial coordinator and veterans' counselor for the Antigo, Wis., School of Vocational and Adult Education, died suddenly August 25.

**By Aaron Adams, Marion, Ind., High School**

## Jigsaw Jones

## *IN THE Morning Mail . .*

[Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Dear Sir:

I look forward to receiving monthly copies of SCHOOL SHOP and am always very much interested in the pages that you devote to news from Washington. The articles you have been including have been inspiring and dynamic. Also, it is one of the best sources that some of us who are removed from the Washington scene have for actual details of what goes on there. . . .

*C. Thomas Olivo,*
The University of the State of New York
Albany, N. Y.

Dear Sir:

I wish to take this opportunity to express my appreciation to you for sending me the SCHOOL SHOP magazine. My students also enjoy the magazine and have successfully constructed many of the projects you have printed.

I have used some of your construction plans in my advanced mechanical drawing classes, general shop, general electricity, leather work, and woodworking.

*James I. O'Neill, Jr.*
Central School District No. 1
Wallkill, N. Y.

Dear Sir:

. . . I have been taking advantage of your kind service for the past four years, having been introduced to your magazine while attending the University of Minnesota, and I have come to appreciate it more each year.

Such things as "Shop Teachers Service" in the October issue are a great help. Also the other regular features such as the projects, the articles, and ideas written by other shop men and passed on by your magazine help to make better teaching possible.

*D. L. Davis,* Shop Instructor
Clear Lake Union High School
Lakeport, Calif.

[EDITOR'S NOTE: Send in your "Shop Teachers Service" coupons immediately and take advantage of the many helpful instructional items.]

Dear Sir:

. . . I wish to thank your magazine for the many fine articles, many of which I find are adaptable in our school.

*John F. Stockman,*
Springfield, Mass., Trade High School

Dear Sir:

Here is a short note of appreciation of your excellent work in the October issue of SCHOOL SHOP. I know others appreciate the invaluable service you render in your "Shop Teachers Service." This is one of the finest gestures I have seen. I read the magazine from cover to cover.

*Joseph Sienko, Jr.*
Woodshop Instructor
Woodland, Wash., High School

Dear Sir:

I have enclosed the list of item numbers. . . . I hope I find these as useful as some I have received in the past and from the information in the SCHOOL SHOP magazine. I feel sure they will be of great value to me.

*Ralph Humphrey,* Jay High School
Chisholm, Maine


"THREE YEARS AGO our school board purchased the BOICE-CRANE 12" x 4" PLANER ...it is THE MOST USEFUL MACHINE IN THE SHOP!"

*A Michigan School Shop Instructor (Name on request)*

Here is a heavy-duty thickness planer of

**PRACTICAL CAPACITY AT A SENSIBLE PRICE**

It includes every feature, but costs over a hundred dollars less than planers only slightly wider and only a few pounds heavier. In a Boice-Crane you get all the capacity that average shops use, at a saving of 30% under the next larger size.

Handles jobs impossible with larger outsize planers. Without butt-feeding, it planes pieces down to 6½" long. Planes hard wood down to as thin as 1/16", smooth as silk and to a thousandth of an inch precision, without tearing. Saves big money by salvaging short and thin scrap.

**OVER 50% FASTER THAN SIMILAR UNITS**

Powered for output of 14 feet per minute. Has a massive, one-piece main frame and the extra weight others lack for hard use. It is your guarantee of many more years of super-accurate use than is possible with inferior bolted-up frames.

**BUILT FOR EXTRA LONG LIFE**

Thousands of installations date back 15 or more years. Machine serial No. 1 still operates daily, having planed millions of feet of hard wood.

**STEADY, POWERFUL, GROOVED STEEL INFEED ROLL**
**THE FINER FEED MECHANISM ELIMINATES COSTLY MAINTENANCE**

No troublesome clutches or double-worm reduction gear which are overly vulnerable to intermittent strains and shocks in feeding stock. Simplified, quieter feed gear fully cushioned against jamb-ups in feeding that cause others to fail. Instant feed control without stopping motor.

**SIMPLE, EASY BLADE SETTING**

12¼" x 20" roller equipped table. Thick walls and exceptionally well ribbed. Stays flat and true.

**SAFER, SMOOTHER OPERATION**

Less power required. Choice of 1½ and 2 H.P. direct to cutterhead or V-belt motor, engine, or lineshaft drive. Bench or complete floor type units.

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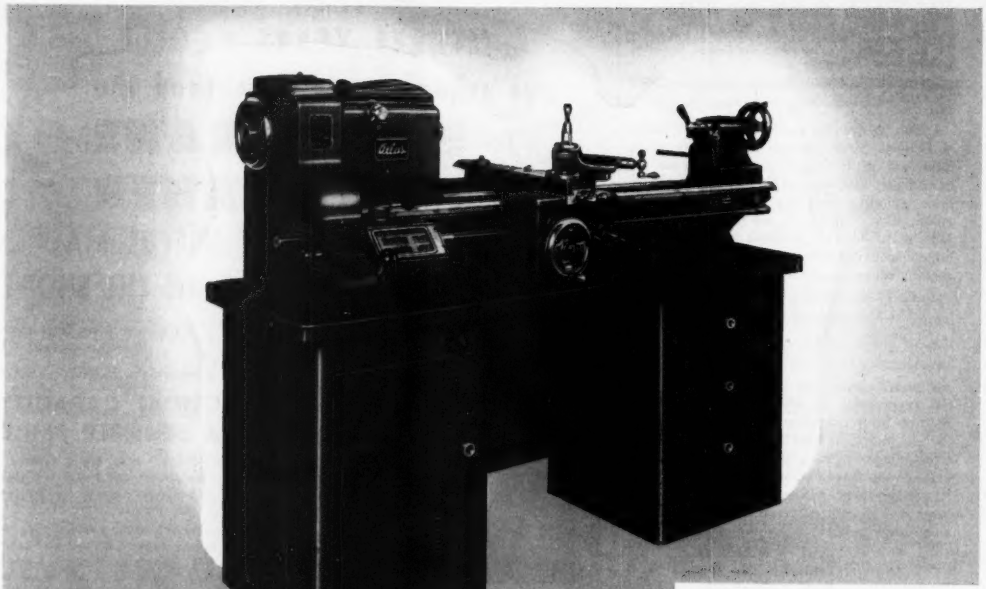


**Atlas-CLAUSING**
**12″ LATHE 6300 SERIES**

**Atlas-CLAUSING**
**12″ LATHE 4800 SERIES**

ANNOUNCING

Atlas

# CLAUSING 12" LATHES

**CLAUSING—a name highly respected for years in thousands of plants —is now a division of Atlas. Atlas-Clausing will continue with the advanced features that are responsible for the Clausing lathe's excellent reputation. And the combined efforts and experience of Atlas and Clausing engineers promise even greater advancements in modern precision lathes.**

## 6300 SERIES

★ 1" COLLET CAP., 1¾" BORE. ★ 12¾" SWING OVER BED, 7½" OVER SADDLE. ★ 24"-36"-48" BETWEEN CENTERS. ★ A.S.A. —L-00 TAPERED KEY DRIVE SPINDLE.

Outstanding construction and performance features include: Bed—heavy, thick-walled with 2 Vee-ways and 2 flat ways precision ground.

Headstock—spindle is forged steel, mounted on selected Timken tapered roller bearings, with ground, hardened nose. Gears are steel, run in bath of oil. Outboard, underneath drive, with dual V-belts. 8 speeds—50 to 1300 RPM. Variable drive (optional) provides infinite variety of speeds between 30 and 1400 RPM. Enclosed quick change gear box, with steel gears and splash lubrication, provides instant selection of 48 threads or feeds, thread range 4 to 224. Acme thread lead screw—supported in gear box by Timken tapered roller bearings.

Apron—heavy, double-walled, automatic, with splash lubrication, positive clutch, steel and cast iron gears.

## 4800 SERIES

★ ½" COLLET CAPACITY, 25 32" BORE. ★ 12¾" SWING OVER BED, 7½" OVER SADDLE. ★ 24"-36"-48" BETWEEN CENTERS. ★ 1½"-8 THREADED SPINDLE.

Outstanding construction and performance features include: Bed—heavy, thick-walled with 2 Vee-ways and 2 flat ways precision ground.

Headstock—spindle is ground alloy steel, mounted on selected Timken tapered roller bearings. Countershaft has friction clutch and brake for stopping spindle without stopping motor. Countershaft spindle turns on ball bearings. V-belt drive. 12 speeds—43 to 2270 RPM. Quick-change gears, 48 thread selections, 4 to 224. Gear box shafts are ground steel, turn on ball bearings. Gears are ½" wide steel. ⅞" lead screw with Acme thread.

Apron—heavy, double-walled, automatic with splash lubrication, positive clutch, steel and cast iron gears.

Catalogs sent on request.

Atlas CLAUSING PRECISION MACHINE TOOLS

**ATLAS PRESS COMPANY**
**1236 NO. PITCHER STREET**
**KALAMAZOO, MICHIGAN**

# Diamond Dust

**Abrasive comments from that doughty Scot, Tom Diamond, former head, Department of Vocational Education, University of Michigan, Ann Arbor.**

## J.C.A.I.C.

THERE is an illustrious professional organization, to which many teachers should belong, and which provides a desirable social status for those who are fortunate enough to be elected to membership. This organization is known as the J.C.A.I.C., which any unbiased educator will agree is quite impressive. While the interpretation of the title is a closely guarded secret of the fraternity, by a special dispensation, the writer has been authorized to reveal at this time that it stands for "Jiminy Crickets Am I Confused."

At one time education, as a science, was confined to a few college professors. They interpreted to the teaching profession such psychological or pedagogical ideas as they felt teachers could comprehend.

As time passed, the professors were disturbed to find that there were a few individuals in the lower echelons who began to grasp some of the profound thoughts which emanated from our college campuses. When this discovery was made the hierarchy responsible for the development of pedagese began to bestir themselves to find new gobbledegook with which to confuse the poor unsuspecting teacher. And so two subjects were born which all teachers must study, but which few are privileged to understand. In the college catalog they are listed as educational psychology and educational statistics, and they constitute the most recent effort on the part of the pedagogs to convince other scientists that their field of activity is indeed a science.

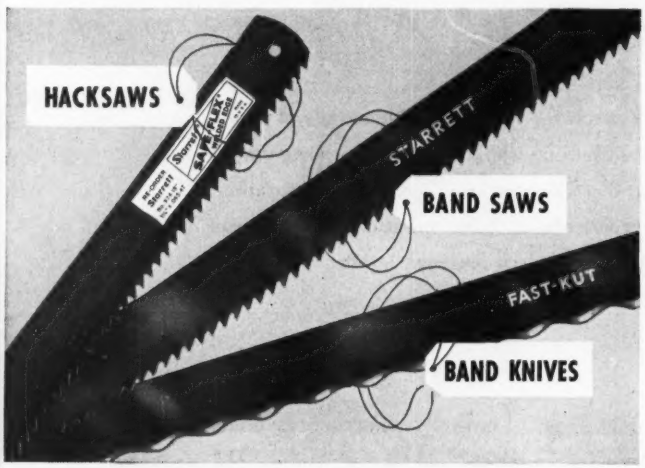
It is too much to expect that the lowly shop teacher will ever fully grasp the significance of the many profound thoughts expressed in both of these areas. For example, what would the average shop teacher, or any other teacher for that matter, make out of a statement such as the following: "Emotion is a complete set of experiences resulting from the overflow of uncoordinated energy into the glands, involving visceral changes, overt random action, and erratic imaginative activity, together with the sensations and feelings caused thereby." Isn't that a marvelous piece of camouflage for some profound truth? Even if by chance the shop teacher could excavate the core of the statement, he still would have the problem of deciding how it could be applied in teaching a pupil how to plane a board.

It is probable that the shop teacher will have to continue his study in both of these areas if he hopes to earn the degree he needs to establish his professional respectability, but the chances are that the relationship of these areas to his job of teaching will remain obscure. However, it is felt that there are a few terms in educational jargon with which he should be familiar if he is to interpret what is happening to his pupils from day to day.

Most teachers have a reasonably clear idea of what is meant by the expression "average," but they haven't the foggiest notion of where a person is who is classified in the 80th percentile. It might be helpful to them in classifying their pupils if they understood that, divested of all the technical verbiage with which it is usually accompanied, this means that the person so classified is as good as, or better than, 80 out of every 100 in the group being considered.

Then, too, the researchers announce that a certain pupil is in the "upper quartile." Teachers use this term glibly. They grasp the idea that, somehow or other, the upper quartile is more desir-

(*Continued on page* 24)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**FREE TO INSTRUCTORS**

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BOOTH NO. 2
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***NEW!*** **Self-centering chuck automatically centers bit. Steel clad, ball bearing head with bronze bushings. Cocobolo handle and head. Strong, sturdy, all-steel box ratchet. Universal jaws. Takes all square taper shank bits and round shanks from 1/8" to 1/2". 5 sizes with 6" to 14" sweep.**

**Stanley "Boy Proof"
Hand Drill No. 617**

***NEW,*** **simplified chuck with hardened jaws and springs protected. Chuck locked on. Strong, lightweight all-steel frame. Large, comfortable handle on extra strong steel crank. Balanced speed gear assures smooth action. 1/4" capacity.**

**Stanley "Boy Proof" Hand Drill No. 626, 1/8" capacity.**

• *Students learn the right way to bore holes easily, naturally, with these Stanley Tools. Their rugged design makes them practical for use in school shops. Add them to your next requisition. Stanley Tools, Educational Dept., 105 Elm St., New Britain, Connecticut.*

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# News

HAPPENINGS IN INDUSTRIAL EDUCATION

## Meetings Scheduled

THE Midwestern Ohio Industrial Arts Association has released its schedule of meetings for the year. The first two have been held at Fostoria and Bryan. The remaining schedule: January 16—Administrators Night, Bowling Green; February 20—Demonstration Night, featuring instructional aids, Open; March 19—Project Night, Open; April 16—Ladies Night, fish dinner, Port Clinton.

The Ohio Industrial Arts Association has again arranged to hold its annual state meeting at the Deshler-Wallick Hotel in Columbus, Ohio. The dates are March 27, 28, and 29.

Chicago's Congress Hotel has again been selected as the site for the 1952 convention of the Illinois Vocational Association April 3, 4, and 5. Showing and demonstrating shop equipment will be one of the main attractions.

The American Industrial Arts Association will meet in the Congress Hotel, Chicago, April 30, May 1, 2, 3, 1952.

The Eighth Annual Oklahoma Industrial Arts Clinic will be held May 26-30, 1952.

The Wisconsin Association of Vocational and Adult Education will meet May 9-10 in Madison.

The draft agenda of the Inter-American Seminar on Vocational Education, to be held next year, includes the possibility of publishing an inter-American review and a dictionary of vocational education terms.

## Power Toolers

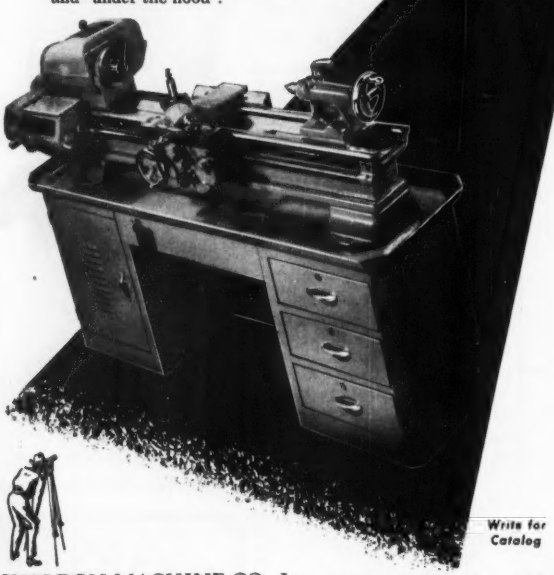
REPRESENTATIVES of ten manufacturers of power tools formed the Power Tool Manufacturers' Association August 21 in Washington, D. C. The charter members are: Atlas Press Co., Boice-Crane Co., Central Specialty Div. of King-Seeley Corp., Double A Products Co., Delta Power Tool Div. of Rockwell Mfg. Co., Duro Metal Products Co., Logan Engineering Co., Magna Engineering Corp., Famco Machine Co., Walker-Turner Div. of Kearney & Trecker Corp.

Officers are Myron H. Buehrer, vice-president and general manager, Boice-Crane Co., Toledo, president; and Herbert Upton, president, Double A Products Co., Manchester, Mich., vice-president.


SHELDON
CHICAGO

*A better Lathe from any angle*

Judge it from any angle: for accuracy, stamina, rigidity or capacity (for size). Check its component parts—its spindle, spindle bearings, lead screw, apron, carriage, bed, gearing, or the power delivered by its drive—you will find the SHELDON Lathe a quality tool both in appearance and "under the hood".



Write for Catalog

SHELDON MACHINE CO., Inc., 4260 North Knox Ave., Chicago 41, Ill.


**Dust . . .** *from page 22*

able than the lower, but many of them have difficulty in determining how these quartiles are established. Here again, when the expression is separated from the impressive studies in which it is used, it becomes relatively simple. It is based on the practice of dividing the total members of a group into subgroups, each one containing 25 percent of the total. Each of these divisions is classified as a quartile, the top 25 percent being in the upper quartile ($Q_1$), the bottom 25 percent being referred to as the lower quartile ($Q_4$). The central quartiles ($Q_2$) and ($Q_3$) are usually referred to as the middle 50 percent.

In some cases the term "median" is used for comparison, instead of average. This expression merely marks the point in a list of scores which indicates that there are just as many who scored higher as those who scored lower than the median.

Like most experts in a field, those engaged in research work will wonder why we take time to mention such elementary terms. However, our experience with college students, and with teachers, has revealed that many of them, while they glibly use the terms discussed here, have difficulty in recognizing their significance when they are confronted with material in which the terms are used. Moreover shop teachers can make effective use of them in their work if they have a thorough grasp of their meaning.

# WESTON *Instruments*

From simple galvanometers or multi-purpose test units, to precise laboratory standards . . . WESTON Instruments inspire their users to new achievements in their quest for knowledge.

Students soon learn to admire the accuracy for which WESTONS have long been famous. Instructors appreciate their stamina and dependability. Critical research workers place full confidence in their indications. And practical administrators know that their year-after-year dependability makes the cost of WESTON equipment remarkably low.

Write for latest details on WESTON Instruments; as well as a free copy of the 140-page monograph "Suggestions for Teaching from the field of Electricity."

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**633 Frelinghuysen Avenue, Newark 5, N. J.**
*Manufacturers of Weston and TAGliabue Instruments*

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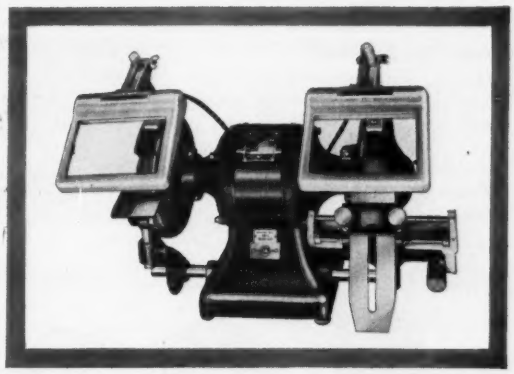

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# School Shop KINKS

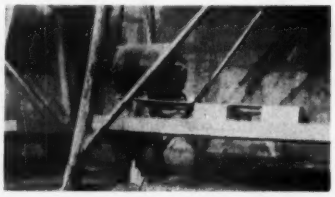
Payment will be made for each Kink published. Send to Editor, School Shop, Ann Arbor, Mich.

### Dowel the Dowels!

Here's a "trick of the trade" in furniture repairing: instead of nailing dowels after gluing to "lock them in place," drill small holes on an angle and glue in skewer or sucker sticks for permanency.—*Stan Schirmacher, Cottonwood, Ariz., High School.*

### Hinge Motor Mounts

Lloyd Heberle, shop instructor at Townsend, Mont., varies the usual movable motor mount setup. He mounts his wood lathe motors directly on the ends of two large strap hinges as shown in the photo below.



The hinges are firmly screwed to wooden blocks and the motor mounted on the free ends. Belt tension is secured by weight of motor. Although the fall would not be great if the belt broke, the area immediately beneath can be covered with sponge rubber or other material to reduce shock in such a case. —*E. V. Reyner, Townsend, Mont.*

### Dummy Dry Cells

Teachers of electrical work find frequently that the cost of equipment is increased materially because of the short circuiting of the dry cells which students use in wiring them in series and in parallel.

We have devised a student participation project to overcome this. Students in woodturning turn pieces of stock to the same dimensions as standard dry cells. The Fahnstock positive and negative terminals are salvaged from old "B" batteries and are attached to the dummies by small woodscrews. These dummy cells are then used for practice work until the instructor is assured that the electricity students know the principles.

We find costs due to damaged dry cells are greatly reduced.—*J. Almon Heyliger, Concord, Mass., Public Schools.*

### Pressroom Hint

When you get a shipment of inks, mark the kind and color on the bottoms of the cans with a vibrating-tool, a cold chisel, the corner of a "hump," or what-have-you. Then you won't have to worry about what happens to the label or how often the lids get changed.—*Herbert Warfel, Joliet, Ill., Township High School.*

### Downhand Welding Kink

In my welding classes I couldn't get the students to hold the rod up high enough for downhand welding. To help them remember I "froze" a rod in the proper position on the welding benches. Since it is right in front of their work, they are constantly reminded of the cor-

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rect position without my saying anything to them.—*James A. Sayer, East Chain Consolidated School, Guckeen, Minn.*

### Preserve Shop Magazines

Much of the value of shop magazines is lost if they are not available in the shop for reference and study at all times. This constant use, however, soon results in mutilated copies, and eventual discarding of the bulk of them. This happens too frequently, even with most devices used to preserve them.

I have found embossed report folders perfect to prevent this wear and tear, and they are the ideal size (9″ x 11½″) for standard magazines such as SCHOOL SHOP. Buy enough at the beginning of the school year for all magazines you keep in the shop, using a different color for each. Identify each copy with title, month, and year in the space on the front of the folder.—*Shelby S. Shake, Southern Illinois University School, Carbondale.*

### Cutting Sandpaper Circles

A need having arisen for some sandpaper discs to be used on a ¼″ utility electric drill, and not being able to await the delivery of an order, the writer decided to devise a means of cutting the needed material quickly. The method selected is presented here as a suggestion to others who may find themselves faced with the same problem.

From the print shop, or a printing supply company, secure a length of printers' cutting rule (knife-edge steel strip). Take two pieces of ¾″ plywood of sufficient size so that a 6¼″ circle may be cut from them, and glue them together. When the glue has set, cut the plywood to the given diameter on the bandsaw. Mount the circle on a lathe and cut a narrow groove, 5¼″ diameter by ⅝″ deep by $\frac{1}{16}$″ wide, into its face. Drill a hole through the center so as to permit a ¼″ hollow punch to pass through it freely. Measure, mark, and cut off the proper length of cutting rule to go around the 5¼″ circle, and insert it in the groove. If it is necessary, wedge the steel strip into place.

Place a standard piece of sandpaper, grit side down, on a flat board, and place the cutting device on top. Strike on top of the device with a mallet or heavy hammer so as to cut the paper. Then insert the hollow punch through the center and cut the center hole. Emery cloth discs can also be cut in this manner. — *Wallace I. Victoria, Queens Vocational High School, Long Island City, N.Y.*

## Ceramics . . . . *from page 11*

out of the pieces needs a path to escape. In biscuit firing, pieces may be stacked one on top of another, or small ones placed inside of larger ones. One can get more pieces into the biscuit kiln since they may be arranged compactly.

Biscuit firing removes the moisture from the clay but leaves the surface of the piece full of tiny holes so that it is moisture absorbent. The next firing operation is designed to put a smooth finish on the piece and make it non-absorbent.

#### Glost Firing

Altho many people refer to the second firing as the glaze firing, the technical name is *glost* firing. One must be very careful in stacking the kiln for glazed pieces. If pieces touch during the glost firing, the melted glaze will cause the pieces to fuse together. All pieces need to be raised above the kiln shelf by use of stilts. Stilts are available in assorted sizes and may be made of clay or they may have nichrome points embedded in clay. ★

## Mock-up . . . . *from page 13*

erated by a toggle switch on the table in front of the distributor. Wire an extra circuit for two or three lights in series on the back part of the table. This will be handy for comparison between parallel and series circuits.

### Motor Underneath

Build a mounting for an electric motor underneath the table directly under the camshaft gear and generator. Mount at least a ½-hp motor on this frame. Be sure the motor shaft will carry two pulleys. On a 1750 rpm motor use a 1″ pulley to pull the distributor and a 2″ pulley to pull the generator. Use a sewing-machine belt on the distributor and a fan belt on the generator.

Connect battery to table, positive side to steel frame and negative side to solenoid switch.

With ignition switch on and with electric motor running, there is a neon flash beside each plug as it receives the high tension spark. The wiring diagram of the car is laid out on the table. The various units are all open and can be watched in operation. This project is flexible both in construction and cost and makes a most useful instructional device. ★

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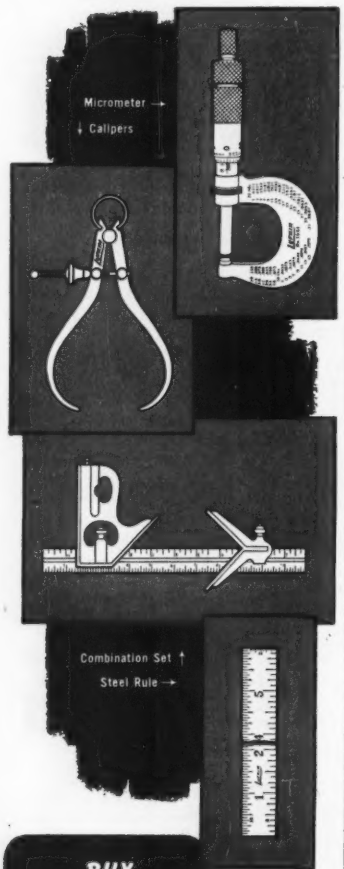


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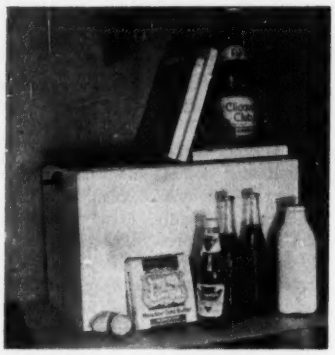
# Cooler Makes Big Hit

***By Walter O. Hayes***

**This relatively simple wood shop project catches student interest through its various outdoor summertime uses. Walter O. Hayes teaches in Roosevelt High School, Des Moines, Iowa**



This versatile portable icebox can serve the family in many ways on summer outings.

TESTED 55 PROJECT

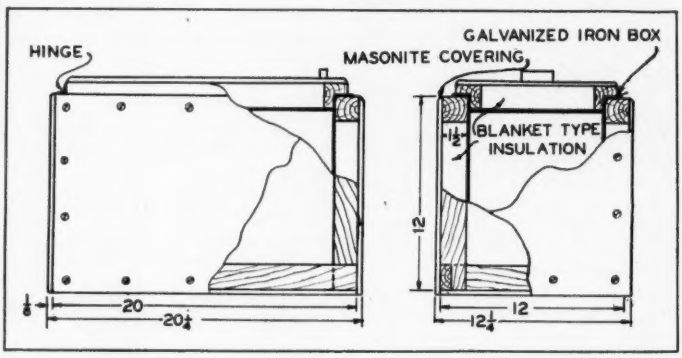
A VERY popular and useful "extra" project in our wood shop for the past few years has been this small, portable icebox. It makes a big hit with the family as a picnic box, frozen fish container, watermelon cooler, traveling cooler, as well as serving as a backyard cooler for cold drinks. Fifteen pounds of ice will last in it for two days.

**Construction Hints.**—Insulation should be of the blanket type to prevent settling to the bottom and loss of effectiveness. The insulation is inserted after the iron box is screwed in place by removing the masonite cover, one side at a time. Tack the blanket in place, smear rubber cement along the frame, and screw the side back on.

The lid is insulated by cementing a ¾" strip of insulation rubber to the top of the box. Smear enough cement around the rubber band to insure adhesion and thorough insulation. The lid may be in one piece or may be built as two pieces and hinged together.

Corner joints may be simple butt joints screwed together since the covering serves as its own stiffener. The frame is only necessary as screw blocks.

Covering is made of masonite fastened with screws. ★




**New College Program.**—Vocational education leaders are viewing with interest a program at Columbia University, initiated in 1950, offering classes to men and women 20 years or older who have not completed high school, but who wish to be accepted for degrees.

The School of General Studies admitted 51 students last fall who had no high-school diplomas. This fall, 24 of these students have been accepted as bachelor-degree candidates, and 11 more will be admitted to degree candidacy next February.

Vocational leaders believe that if the program further proves practical, useful and popular, more academic high-school students may turn to vocational education, in order to hasten income earning capacity, postponing higher education until a later date.

Many who enroll in academic courses at secondary level, are unable to go on to college or university, and often find themselves unfitted to earn. ★

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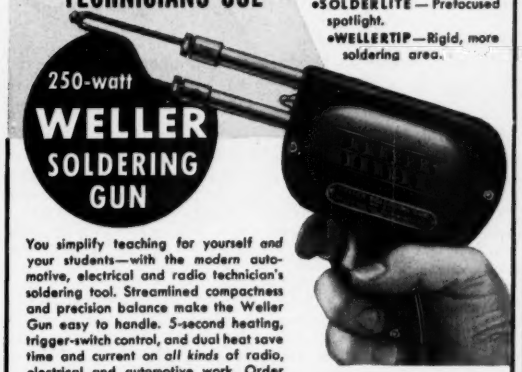


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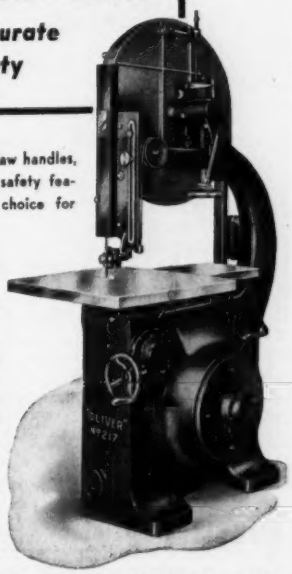


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# *Instructional* RESOURCES

### *Books:*

**Inter-American Cooperation in Vocational Education.** Romero. Washington: Department of Cultural Affairs, Division of Education, Pan American Union, 1950. Pp. 188. $1. Paper-bound.

Part VII of a handbook of vocational education in preparation by the newly-organized vocational education section of the Union. The series covers the present status of VE in the Americas, objectives, and means to attain the objectives. This volume reviews the work of agencies set up to coordinate efforts in this field and suggests ways of directing current trends. Written principally for Latin Americans, it also aims to show U. S. vocational people the international effects and aspects of the field.

Fernando Romero is chief of the VE Section of the Pan American Union.

**Problems in Mechanical Drawing. Second Course.** Levens and Edstrom. New York: McGraw-Hill Book Co., 1951. Pp. 56. $1.60. Paper-bound.

A second-year workbook in basic drawing. It is keyed to *Mechanical Drawing* (5th Ed.) by French and Svensen. This workbook ". . . covers threads and fasteners, sections, dimensioning, and detail and assembly drawings of a more involved and practical nature. Pictorial drawing is included . . ."

A. S. Levens is professor of engineering design, University of California. A. E. Edstrom is instructor, City College of San Francisco, and lecturer in engineering design, University of California.

**Motorist's Fix-It Book.** Chicago: Popular Mechanics Press, 1951. Pp. 144. $2.

A practical, illustrated handbook for the average car owner. Tells how to do your own electrical work, painting, tire upkeep, motor tune-up, wheel alignment, trouble shooting, brake, clutch, battery, generator, and cooling system servicing, lubrication, body and fender repair; increase gasoline mileage; diagnose car noises; make accessories, etc.

**AM-FM Manual, Volume 22.** (Perpetual Trouble Shooter's Series.) New York: John F. Rider, Publisher, Inc., 1951. Pp. 1520. $18. (Loose-leaf binder.)

This volume covers equipment for the period November, 1950 through August, 1951. It contains factory-authorized servicing data from 62 manufacturers on AM-FM receivers, auto radios, record changers, and disc and tape recorders. Cumulative index is given for volumes 16 through 22.

**Machine Shop Mathematics.** Axelrod. New York: McGraw-Hill Book Co., 1951. Pp. xi + 359. $3.60. Second Edition.

In this revision, much of the text has been rewritten and three chapters have been added to provide a broader base of needed applied mathematics. The book is adapted for use in vocational and trade schools, having been based on the author's analysis of mathematic needs in the machine trade, and tried out over a number of years in the shop.

Aaron Axelrod is teacher of machine-shop mathematics and science at the Bayonne, N. J., Vocational and Technical H. S., and instructor of applied science and mathematics, School of Education, New York University.

**Carving Animal Caricatures.** Waltner. Bloomington, Ill.: McKnight & McKnight Publishing Co., 1951. Pp. 104. $1.50. Paper-bound.

This attractive booklet for the hobbyist uses large-scale photos and diagrams to show how to make caricature carvings of various animals. Photos show each step in carving the first figure. Capturing various moods of dogs is featured. The profile patterns are all full size and may be transferred directly to the wood.

Elma Waltner is a crafts designer living in Hurley, South Dakota.

**Pressman's Ink Manual.** Halpern. New York: Bullinger's Guides, Inc., 1951. $6. (Discounts to schools.)

This book has been written so as to be easily understandable to the lay pressman, and to serve as a reference source to teachers and others. It explains causes and remedies of some of the basic ink problems. Many drawings, photos, and color plates are included. Some topics are: relation of ink to photoengraving and paper; color theory; compounds; driers; vehicles; process printing; special inks; ink logs; charts for mixing and matching colors; estimating inks; selecting proper screens, etc.

George M. Halpern is director of the Manhattan School of Printing, New York.

**Truck and Tractor Guide.** Graham. New York: Theo. Audel & Co., 1951. Pp. xxix + 1298. $4.

The author says his purpose "is to show the basic principles—theory, construction, operation, maintenance, and repair of gas and diesel trucks, tractors, and heavy duty motor vehicles, including service operations . . ." Each part is taken in detail, and then correlated with instructions for assembly and disassembly. Numerous illustrations accompany the simple language of the text.

(*Continued on page* 32)

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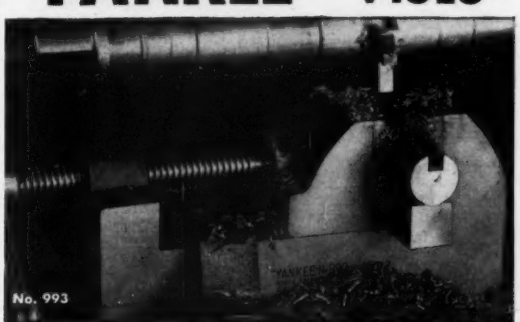


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Frank D. Graham is on the staff of Theo. Audel & Co.

### *Pamphlets:*

**Television Tube Location Guide. Volume 2.** This booklet gives 439 sketches of tube layouts in new TV receivers marketed since Volume 1 was published. It aids the technician or amateur by showing tube location and function at a glance and source of common TV failures. Delay and expense of chassis removal is avoided. Available for $2 from Howard F. Sams & Co., Inc., Indianapolis 5, Ind.

**Use of the Grinder.—Band Saw.—Drill Press.** These three pictorial folders are available free from Kearney & Trecker Corp., Walker-Turner Div., 639 South Ave., Plainfield, N. J. Student plan sheets for general shop are available at 50c per 100, and a safety poster can be had free.

**Bibliography of Forest Industry Educational Materials. School Bibliography: Our Forests, Their Use and Conservation.** These two pamphlets are available on request from American Forest Products Industries, Inc., 1319 18th St., N. W., Washington 6, D. C. They list booklets, motion pictures, posters, filmstrips, leaflets, and other educational materials on trees and wood products manufacture made available by individual forest industries.

**First Book of Feltcraft.** This 31-page pamphlet presents numerous simple and attractive projects together with patterns for making them from felt. General hints for beginners are included. A useful guide for craftwork on the elementary-school level. Copies are 50c each from Fun with Felt Corp., 390 Fourth Ave., New York 16, N. Y.

**Design, Construction & Operating Principles of Electromagnets for Attracting Copper, Aluminum & Other Non-Ferrous Metals.** The author, Leonard R. Crow, describes an electrical training aid invented and designed by himself which he has found effective in demonstrating principles of electromagnetism. Mr. Crow is director of research and development of Universal Scientific Co., Inc. Copies are $1 each paperbound, or $1.25 each clothbound, from The Scientific Book Publishing Co., Vincennes, Ind.

### *Audio-Visuals:*

**You Can Make Jewelry. American Braiding Craft. Native Crafts.** These are new filmstrips published by the Chas. A. Bennett Co., Inc., Peoria, Ill. The first is in two parts, and is based on the book *Cabochon Jewelry Making* by Arthur and Lucille Sanger. Only American semi-precious stones available to everyone and requiring the simplest materials and tools are included. The second filmstrip is based on the book *Palmetto Braiding and Weaving* by Cooke and Sampley. Rushes and other materials are also included. *Use of Native Craft Materials*, a recent book by Margaret Shanklin, forms the basis of the last strip.

**Grits That Grind** is a new 16mm kodachrome sound film tracing modern abrasives from mining of bauxite to finished products. Write the Norton Co., Publicity Dept., Worcester 6, Mass., giving dates desired for showing.


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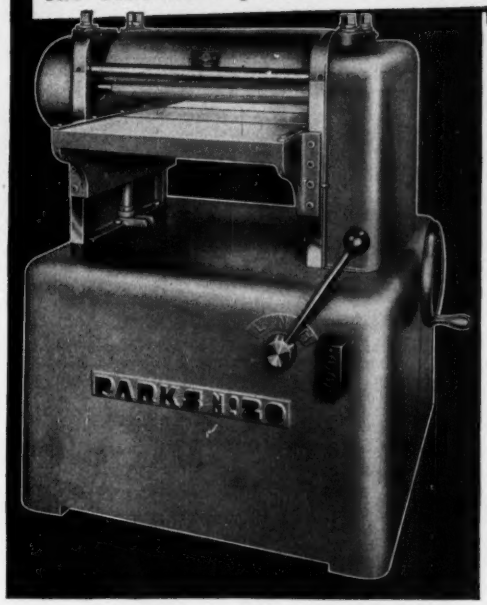

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Photo courtesy of Lisbeth Schaeffler, New Rochelle, N.Y.

**says a New Rochelle Sculptress**

Shown left is Miss Lisbeth Schaeffler of New Rochelle, N.Y., unloading beautifully hand-made ware from her Harper Electric Studio Kiln SK-151416. In a recent letter, Miss Schaeffler who purchased her Harper Kiln 5 years ago says:

"I can't say enough for the performance of my Harper Kiln. I have fired it on the average of once a week since I bought it in 1946 and this is the first time I have had to replace the elements."

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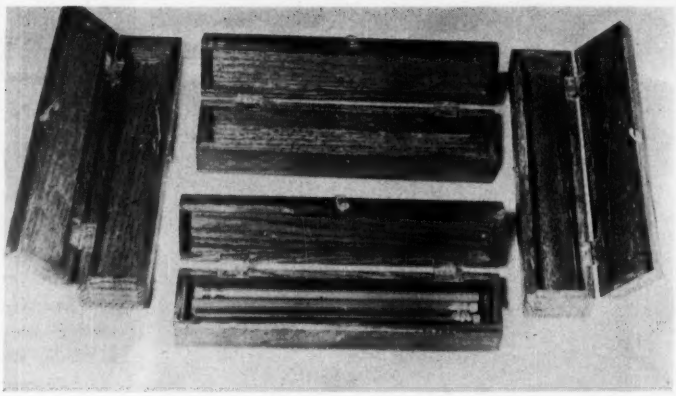


These handsomely finished pencil boxes will appeal to the beginning woodworking student.

# Try This Pencil Box

By J. J. HASENAU

**An excellent means of teaching the elements of setting hinges and making boxes is presented by this little project. J. J. Hasenau teaches woodworking at Chadsey High School, Trade Division, Detroit, Mich.**

Bill of Material

| *No. Req.* | *Name* | *Size* |
|---|---|---|
| 1 | Plywood or Hardwood | ¼ x 3 x 22 |
| 2 | Hinges | ¾ x ¾ |
| 1 | Aluminum or Brass | 1/16 x 1 x 1 |
| 2 | Screws, rd. hd. wd. | No. 2 x ¼ |
| 8 | Screws, fl. hd. wd. | No. 2 x ⅜ |

TESTED SHOP PROJECT

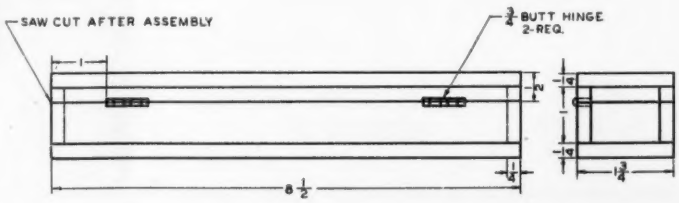
THIS pencil box and its many possible variations is an excellent project in helping students "get the hang" of the basic principles of making a simple box with hinges.

The parts are laid out in strips of equal widths so that the side and ends make up a 1"-wide piece 22" long. Similarly the top and bottom are 1⅞" wide and 17½" long. By sanding or squaring the ends of the end pieces only, the work is simplified. Glue up a hollow frame using the end pieces and the sides. Let the sides lap about 1/64" over the ends. This can be sanded off after the box is completed.

After this has set, flatten the top and bottom of the frame, then glue the top and bottom pieces in place. Finish the outside of the hollow box by planing and sanding. Cut the box in half on the hinge line. Smooth these surfaces so that they fit without rocking. Make the notches or gains for the hinges one-half the depth of the hinge pin. In fastening the hinges, drill guide holes for the screws. Countersink screw holes in the hinges to fit screws. A small latch can be designed and fastened with small round-head screws.

If plywood is used, an enamel finish looks good and covers up the edges. Oak and other hard cabinet woods make attractive-looking boxes especially when the natural finishes are brought out.

The size, hardware, and joint construction may be varied to make instrument boxes, tool boxes, and various open types. ★



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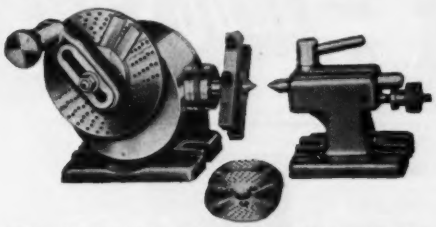

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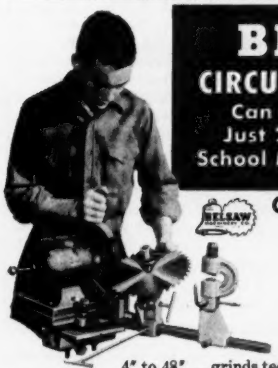

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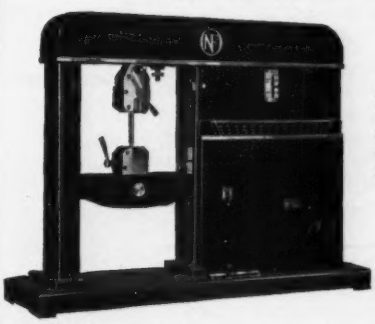

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# News from INDUSTRY

### Allen Motor Analyzer

A new, compact, moderately-priced motor analyzer (Model E-322) is announced by the Allen Electric and Equipment Co., 2101 N. Pitcher St., Kalamazoo, Mich. It will perform all tests essential for modern engine diagnosis. Each unit may easily be removed from the cabinet for fast, accurate testing in any part of the shop, or on service calls. The analyzer is of simplified cabinet design, rugged welded steel construction, finished in durable sand and cream baked enamel, equipped with large storage compartment, the cover of which provides working area when closed.

For details, write the company, mentioning SCHOOL SHOP; *or check no. 20 on the coupon.*

### Clean Powder Lubricant

"Grafize" is the name for a new powder lubricant for the machine shop and many general uses. It has the advantage of being clean to use, as it will not even soil a handkerchief. It can be added to oils and greases for turning, threading, broaching, reaming, drilling, milling, grinding, and spinning. It comes with a new type rubber refillable applicator as illustrated.

For further information and a *free* sample, write to Reardon Products, 2109 S. Adams St., Peoria 2, Ill., mentioning SCHOOL SHOP; *or check no. 21 on the coupon.*

### Machine Shop Project Sheets

Both tool-type projects and "take-home" projects are included in a machine-shop project sheet series by the Norton Co., Worcester 6, Mass. The series is designed to aid teachers and students in both the industrial-arts and vocational fields. The first project is "Setup or 1 x 2 x 3 blocks," which are used for setting up work on surface grinders, milling machines, etc.

For further information write the company, mentioning SCHOOL SHOP; *or check no. 22 on the coupon.*

### New Tyler Bandsaws

Three new 15" bandsaws have been announced by Tyler Mfg. Co., Inglewood, Calif. Speed ranges from 80-5000 fpm are provided by turn of hand crank —no belts or gears. It is claimed they are the only ones in a low-price, high-capacity range offering an infinite speed arrangement. Incorporated in the unit is a blade tracking device utilizing a large yoke which places the pivot point at the crown of the upper band wheel. This holds the crown in perfect alignment with the bottom wheel at all times. Special Spyral guides to give quick and easy changeover for either Tyler Spyral blades or the conventional flat blade are supplied. The Spyral blade can be used for special cuts in virtually any material.

For full informatioon, write the company, mentioning SCHOOL SHOP; *or cheek no. 23 on the coupon.*

### Low-Cost Copying Machine

The Charles Bruning Co., Inc., 100 Reade St., New York City, has just introduced a new, economical Copyflex machine for draftsmen, Model 20. It represents three years of research for advanced design and wide printing width (46") at low cost, and is ideal for medium volume production of prints from tracings, engineering drawings, and other large sized technical originals. Copies may be made on sensitized paper, acetates, films, and cloths.

For more details, write the company, mentioning SCHOOL SHOP; *or check no. 24 on the coupon.*

### Bar-Mor Collet Tool Holder

A very handy tool in the machine shop is the "Bar-Mor" collet tool holder manufactured by Montgomery & Co., Inc., 53 Park Place, New York 11, N.Y. The single unit construction of holder and cutter gives it exceptional strength and rigidity, permits easy setting at constant tool height, free access to work without disturbing setup, faster feed, and heavier cuts. It can do left and right-hand turning and drilling, turning and facing, boring, internal screw cutting, and cutting a square thread. The tool holder holds square and round tool bits, twist drills, reamers, and countersinks and is mounted in the tool post.

For full details, write the company, mentioning SCHOOL SHOP; *or check no. 25 on the coupon.*

### Shop Layout Contest

In an effort to encourage the development of better school shops, the Delta Power Tool Division, Rockwell Mfg. Co., is sponsoring a contest open to school men and to students at accredited teacher-training colleges.

The contest offers a first prize of $1000 worth of any Delta tools, to be selected by the winner. Thirty-seven prizes in all are being offered. Contestants must have their entries in to the company by July 31, 1952. Their names will be announced at the American Vocational Association convention in Boston in November. Entries will be judged from the standpoint of teaching efficiency, administrative compatibility, and architectural soundness.

Prizes will be offered in six school divisions: elementary school, high school, junior high school, senior high school, technical high school, and technical institute shops.

Entry blanks and instructions may be obtained from the Delta Power Tool Div., Rockwell Mfg. Co., 600 East Vienna, Milwaukee 1, Wis. (mention SCHOOL SHOP); *or check no. 26 on the coupon.*

## New Literature

**Red Devil Tools,** Irvington 11, N.J., has issued a new 96-page catalog (No. 21) covering all of its products. It includes glazier's tools; putty knives and wall scrapers; wood, paint, and glass scrapers; paint conditioning machines; floor conditioning machinery; and many hardware specialties including masonry drills. Valuable technical data on proper tool application and care is given.

For free copy, write to the company, mentioning SCHOOL SHOP; *or check no. 27 on the coupon.*

**Edison Nickel-Iron-Alkaline Storage Batteries for School and College Laboratories** is an eight-page illustrated leaflet describing the construction, operation, and uses of these batteries. For free copy, write Thomas A. Edison, Inc., Storage Battery Div., W. Orange, N.J., mentioning SCHOOL SHOP; *or check no. 28 on the coupon.*

*Each item listed above is numbered. Check the numbers of the items you want, and mail the coupon, properly filled in, to . . .*

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*Ann Arbor, Michigan*

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**Washington . . . .** *from page 40*

ority given the additional $30,000-plus for noncompliance travel, it did question failure of USOE to ask for additional funds from the Congress.

What travel for compliance was made, was unreliable, in the opinion of the probers, and they also felt that reports to Washington received "ineffective" review, and that follow-up was "slow and inefficient."

The report of an unidentified state was cited as an example. This report was received on September 29, 1950 (late) and about a month or six weeks later it was reviewed. At the June hearing, the statistician who handled this report, said she had found it "replete with obvious error," but that the state was certified for full 1950-51 allotment.

On February 12, 1951, it was related, the Committee called this report to the attention of the Vocational Division and a reports analyst sent a letter to the state director citing 17 paragraphs of deficiencies. These, said the report "go to the very heart of the program. Obviously the state should not have been certified under such conditions, and the administrative personnel responsible therefor are . . . guilty of extreme carelessness."

**USOE Late in Replying.**—This 17-page letter received no reply until July 17, the report states, and USOE did not follow it up until advised that hearings were scheduled for June.

The name of this particular state was omitted from the report by design. The Committee, however, lists the following as states whose 1950 reports contained mistakes: Alabama, Delaware, Florida, Idaho, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York, North Carolina, North Dakota, Ohio, Oregon, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, Wyoming, District of Columbia, Hawaii, and Puerto Rico.

Ten states—Arizona, California, Connecticut, Maryland, Massachusetts, New York, Pennsylvania, Texas, Utah, and Vermont—were also listed as being tardy in submitting their 1949 and 1950 reports. The unidentified state cited as an example whose 1950-51 allotment should not have been certified, not only contained errors but was tardy.

**D. O. Program Questioned.**—In the diversified occupations program, the Committee found conditions which it questioned. This is a highly popular program, which has been praised by, among others, the National Association of Manufacturers. The Committee felt that it was unusual that the Division could not explain, to the satisfaction of the probers, how one instructor could handle 29 students being trained in 22 different occupations.

It saw fit to cite, without comment, the fact that Dr. Gregory said he had never attended a D.O. class.

The question of night classes was scrutinized, and the Committee was very displeased with results of its inquiry of Drs. McGrath and Gregory.

The investigators found that one state listed a course in business education with yearly meeting periods of 6179 hours and with 3269 students. Several explanations for these data were offered at the hearings, ranging from the possibility that classes were conducted seven days a week, with more than 16 hours a day devoted to instruction; that classes were conducted five days a week, with more than 20 hours of daily instruction, or each of the 3269 received a total of two hours of instruction. Dr. Gregory adduced that perhaps there was as much as 90 percent attrition in the program, so that each student did receive a normal amount of instruction.

"If 90 percent attrition is usual for vocational evening classes," the Committee concluded, "it is questionable whether the intent of Congress is being carried out in conducting this evening program. The state was reimbursed for this class in spite of the fact that not a single official of the Division of Vocational Education was able to place any reasonable or logical interpretation on the report."

In fact, said the Committee, no effort was made to clear up the discrepancies in the report from September 15, 1950, to the date of the June hearing.

At the hearing Chairman Hardy held Dr. McGrath responsible, but the Commissioner said he should not be concerned with such details, that it was Dr. Gregory's responsibility. He finally agreed that it was his responsibility to see that an interpretation was made.

The Committee felt that the Division of Vocational Education is amply staffed, numerically at least. Of the 85 people assigned during fiscal 1951, the committee found 51 were professional, and 58.5 percent were receiving $7,620 or more. "It would seem that the efficiency of this Division should be at a high level," the Committee said. "This, unfortunately, is far from the fact."

**For the Future.**—The Committee makes

these recommendations:

1. Decisive allocation of functions and responsibilities, with tighter supervision.
2. Closer working relationships with states, periodic field visits for program review, analysis, and exchange of ideas.
3. Comprehensive studies of procedures, techniques, and forms to assist in eliminating delays and errors.
4. Coordination of program and fiscal audits.
5. Closer consultive relationship with USOE's legal staff.
6. More effective method of determining whether professional personnel meet qualifications in state plans.

**Transfer.**—Reliable reports in Washington have it that three major farm organizations, the National Grange, the Farm Bureau Federation, and the Cotton Council, are trying to rewrite S. 1149 for submission to the Congress in January.

What position vocational agriculture will have in this effort is not known, although these organizations have favored its transfer to the Department of Agriculture.

Before hearings on S. 1149 were concluded these three were to file a joint statement. They couldn't get together and did not file the statement. Now they are said to be trying to get together on a bill.

**Reversion.**—The federal government is appearing in the guise of an "Indian giver," and is making an effort to reclaim many machine tools it once graciously turned over to states for use in schools and other institutions.

Because of the acute bottleneck in the machine-tool industry, the defense agencies are now eying equipment once donated to help train defense workers, returning veterans, and run-of-the-mine vocational students.

The government, working through the Federal Security Agency, is taking two courses to recapture these tools:

1. It is seeking to locate those tools to which it still retains title. Most grants of World War II surplus machine tools were made with a string attached; the recipient was required to use the tools for a specified number of years—in some cases five, in others three. Tools, not now being used, which fall in this category, the government may simply recapture.

2. Schools having full title to surplus tools, or having tools acquired in any other way, are being urged to report the tools to state purchasing offices or state surplus property offices. These offices will then, in turn, notify the National Production Authority, which will adequately reimburse the school and assign the particular tool to the military agency having greatest need at the moment.

FSA Field Service Office officials say they are looking only for tools which schools are not using. Such tools fall into two general categories:

Those tools in schools where GI training has dropped off and the programs no longer require the use of the equipment; and those tools which never have been used because of faulty descriptions on surplus property registers. It has been found that a school would order a tool from a formal description and then find it entirely inadequate.

FSA is also working on a program so that, as the bottle neck is broken and new tools are provided for defense industry, these surplus tools will once more flow back from the government to the schools. Many of the tools, perfectly suitable for instruction and training, would have only a brief life under constant industrial use, even after they have been overhauled.

The program is an expansion of one undertaken in the San Antonio, Texas, area by the Air Force which resulted in the recapture of equipment having a replacement value of more than $15,000 in today's market. It is hoped that the program on a national scale will recapture several million dollars worth of tools.

Best guess among vocational educators is that some schools will be happy to get rid of some of the "white elephants" that overenthusiastic shopmen snagged after the war.

FSA is working through state offices entirely and depending on states to locate idle tools in local schools.

**Construction Needs Get a Hearing.**—NPA'S drastic curtailment of steel, copper, and aluminum for school construction brought down the wrath of Congress which passed a strong resolution calling for increased allocations of these metals for schools and hospitals. So intense was the interest of House members in the issue that approximately half of them requested to appear before the committee or filed statements. Manly Fleischmann, Administrator of the Defense Production Administration, said he considered the Congressional request a "directive" but was unable to promise that he could provide more steel without an opportunity to review all the other programs.


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**Inefficiency Charged.**—Officials of USOE's Division of Vocational Education and Commissioner Earl J. McGrath are still reeling under an official indictment, wherein one of the mildest charges is that of inefficiency.

The indictment was made by the Expenditures in Executive Departments Committee of the House, which approved a report of a study of the Vocational Division made by the Government Operations Subcommittee

It is reliably stated that the report, originally, was much harsher than the final, approved draft—if such is possible—but that it was softened before publication.

Before the report was submitted to the full committee for approval, it was forwarded for comment to Dr. McGrath and Dr. Raymond W. Gregory, Assistant Commissioner for Vocational Education. They had no comment.

The Subcommittee making the study is headed by Representative Porter Hardy (D. Va.) and includes Representatives Richard Bolling (D. Mo.), John Shelley (D. Cal.), William Lantaff (D. Fla.), Walter Baring (D. Nev.), R. Walter Riehlman (R. N.Y.), George H. Bender (R. O.), and George Meader (R. Mich.). Staff work was done by Ralph E. Casey, Counsel; Gordon P. Peyton, Special Counsel; and Frances G. Hardy, Administrative Assistant.

The study included review of records in the Vocational Division and a hearing, in executive (private) session, on June 17.

**States Criticized.**—Although the study was confined only to the federal agency, the report implies criticism of opertions under the Smith-Hughes and George-Barden laws in the states themselves. In reviewing the records of USOE it found reason to question the legality of many of the approved programs. The report confined its criticism to USOE for failure to properly police these programs, but it is obvious that some states were equally in error.

The Committee has no plans for further study of the vocational programs, but the issue is not necessarily ended. The Committee has authority, if complaints warrant, to continue the probe and the next step would be investigation and study in individual states.

The purpose of the study, according to the report, is "not to embarrass or criticize but to call . . . attention (to) . . . such discrepancies as might be found to exist and to . . . (remedy)."

The Committee believes it found "discrepancies."

Aides of the Subcommittee made it clear that criticism of the vocational-education program as such is not intended, but only of its administration.

"Nothing," said the report, ". . . indicated that a proper program would not justify the amounts expended, but a serious question is presented as to whether the Office of Education clearly determines that these amounts were actually expended in complete accord with Congressional intent."

The Committee believes that the annual review of state plans is nominal only. The report says Dr. Gregory could offer no "clear-cut" explanation of procedures followed.

The investigators asserted that original state plans were not submitted to USOE's legal staff to determine compliance with statutory criterions.

Moreover, said the report, federal assistance to states in drafting plans was "meager." It is significant that lack of adequate service is a reason given by some vo-ag people for wanting to transfer agricultural education to the Department of Agriculture.

**Program Audits Faulty.**—The Committee found fault with the handling of program audits. Under the law, participating states and territories must submit programs for audit by September 1. USOE gives them until September 15. Many are later than this, but the Committee found no evidence that legal sanctions had ever been invoked.

The following states, according to the Committee, were later than September 15 in submitting their reports for 1949 and/or 1950: Arizona, California, Connecticut, Idaho, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Nevada, New York, North Carolina, Oregon, Pennsylvania, Texas, Utah, Vermont, and Wisconsin.

USOE, in turn, the Committee said, is lax in reviewing these audits. For instance, as of June 21, 1950, audits of two states for 1949 were incomplete.

Furthermore, in the opinion of the Committee, program review by officials within the states ". . . seems vague, cursory, and ineffective." USOE officials make too few visits (another complaint of vo-ag people), and these never beyond the office of the state director.

At the hearing, Dr. Gregory said 20 days per state, costing about $19,200, would be adequate, but that insufficient travel money was available. Budget data, said the report, showed that for fiscal 1951, the Division had $39,892 for travel, of which only $7,608 was vouchered for compliance travel. This covered 523 days, or more than one-half the time said to be adequate. While the report did not question the higher pri-

(*Continued on page* 38)

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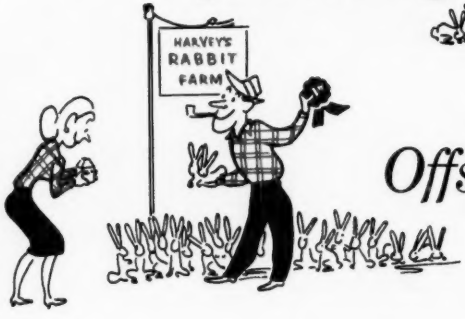


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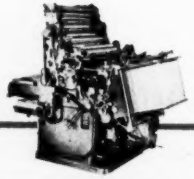

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